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PATENTS FOR INVENTIONS.

ABRIDGMENTS

OF

Specifications

RELATING TO

WEARING APPAREL.

DIVISION I.
HEAD COVERINGS.

A.D. 1637–1866.

PRINTED BY ORDER OF THE COMMISSIONERS OF PATENTS.

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PREFACE.

THE Indexes to Patents are now so numerous and costly as to render their purchase inconvenient to a large number of inventors and others, to whom they have become indispensable.

To obviate this difficulty, short abstracts or abridgments of the Specifications of Patents under each head of Invention have been prepared for publication separately, and so arranged as to form at once a Chronological, Alphabetical, Subject-matter, and Reference Index to the class to which they relate. As these publications do not supersede the necessity for consulting the Specifications, the prices at which the printed copies of the latter are sold have been added.

The number of Specifications from the earliest period to the end of the year 1866 amounts to 59,222. A large proportion of the Specifications enrolled under the old law, previous to 1852, embraces several distinct inventions, and many of those filed under the new law of 1852 indicate various applications of the single invention to which the Patent is limited. Considering, therefore, the large number of inventions and applications of inventions to be separately dealt with, it cannot be doubted that several properly belonging to the group which forms the subject of this volume have been overlooked. In the progress of the whole work such omissions will, from time to time, become apparent, and be supplied in future editions.

This volume contains Abridgments of Specifications to the end of the year 1866. From that date the Abridgments will be found in chronological order in the "*Chronological and Descriptive* Index" (*see* List of Works at the end of this book). It is intended, however, to publish these Abridgments in classes as soon as the Abridgments of all the Specifications from the earliest period to the end of 1866 have appeared in a classified form. Until that takes place, the reader (by the aid of the Subject-matter Index for each year) can continue his examination of the Abridgments relating to the subject of his search in the Chronological and Descriptive Index.

As wearing apparel forms a very comprehensive series, it has been thought advisable to divide it into four parts, namely, head coverings, body coverings, foot coverings, and dress fastenings.

The present volume therefore relates to bonnets, women's caps, bonnet and cap fronts, hoods, hats, caps of all kinds for men's wear, helmets, and shakos. It comprises the methods of making these articles; the preparation of felt, plush, straw, whalebone, and other materials used for the same, but not the manufacture of the materials unless expressly intended for hat or cap-making; the apparatus and machinery employed in the manufacture; and the various processes invented for waterproofing and ventilating the articles. Goffering machines are included, but not sewing machines; and bonnet and hat boxes and inventions for fixing a mirror or an eye-glass in a hat have been admitted.

The Abridgments marked thus (* *) in the following pages were prepared for another series or class, but as they also relate to subjects belonging to the present series, they have been reprinted in this volume.

B. WOODCROFT.

June, 1874.

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INTRODUCTION.

As a history of wearing apparel, from the fig leaves and coats of skin of our first parents to the costume of the present day, would be impossible in a mere introduction, it is proposed to confine these remarks, as closely as circumstances permit, to the dress worn by the inhabitants of this island, dividing the subject into *body coverings, head coverings, and foot coverings.*

Our knowledge of anything relating to the British islands before the Roman invasion is very limited and imperfect. No written records of either the Britons or the Gauls have come down to us. A *few scattered* notices in the works of some of the later Greek and Roman authors make up all the direct information which we possess, and it may be fairly doubted if all these writers had any good opportunity of ascertaining the facts of which they make mention.

Julius Cæsar informs us that the inland inhabitants of Britain were clad in skins of animals; that the parts of the country on the sea coast were inhabited by men who had come over from the Belgae; that the most civilized people were the inhabitants of Kent, not differing much in their ways from the Gauls, and that all the Britons stained their bodies with woad which produces *caeruleum colorem* (a greenish-blue colour). Other writers allude to this custom; Ovid uses the words *virides Britannos* (green Britons); Martial, *caeruleis Britannis*; Pliny too mentions it. Strabo describes the inhabitants of the Cassiterides as clad in black cloaks girt about the waist and reaching down to the ankles, walking with staff in hand, and wearing beards as long as those of goats. He says also that the Britons in their manners partly resemble the Gauls. Tacitus writes that the Britons are next to the Gauls and like them.

As the inhabitants of the south of Britain came from Gaul and kept up a connection with the people of that country (Cæsar asserts that one of his reasons for invading Britain was that the Britons furnished the Gauls with auxiliaries) it may be presumed that the Gauls communicated to them whatever knowledge they possessed of manufacturing cloth, &c., &c. The cloaks mentioned by Strabo may have been skins, but were more probably of some woollen texture. Now as clothing is perhaps one of the chief signs by which the degree of civilization among an early people is indicated; as Diodorus Siculus informs us that the Belgic Gauls wore dyed tunics beflowered with all manner of colours, and (*bracae*) trousers; as Martial alludes to *veteres bracae Britonis pauperis* (the old trousers of a poor Briton); and as the statues of the ancient Gauls in the Louvre are represented clad in long cloaks (buckled or buttoned on the right shoulder or on the breast), tunics, loose trousers (gathered in at the ankles), Phrygian caps, and shoes, it may be reasonably concluded that somewhat similar was the ordinary dress of our ancestors, and that they were fairly civilized for their times. Knight, in his History of England, remarks that the addition of a pin or button, to render the loose cloak of the savage more comfortable, marks an advance in his general civilization; so does the addition to his attire of one piece after another for convenience or decoration; mere expediency is at first his standard, but as his wants increase and his tastes improve, the narrow limits of necessity are soon overstepped for those of decency, gracefulness, and splendour. Ornaments too were not rare among them; we read of rings, bracelets, armlets of iron, copper, silver, and gold. The torque (variously spelt and latinized *torquis*) was probably a symbol of nobility or command. Tacitus writes, that when Caractacus was led captive through the streets of Rome, several torques (spoils which he had taken from his enemies in Britain) were carried in the procession. The ring, says Pliny, was worn by the Britons and Gauls on the middle finger. The bracae was the garment which particularly distinguished the Greeks and Romans from other nations. Virgil calls them *Barbara tegmina crurum* (foreign coverings of the legs).

The Britons appear to have readily adopted the dress of their Roman conquerors. We learn from Tacitus that so early as during the command of Agricola in Britain the sons of the British chieftains began to affect the Roman dress. The bracae were abandoned, and the Roman tunic reaching to the knee, together with the toga, became the general attire of at least the superior classes. The tunic may be described as nearly resembling in shape a modern plain shirt.

From the final departure of the Romans (about A.D. 420) until the Norman conquest, the bracae gave way to tight hose or leggings of leather, cloth, or linen, but as they reached up the thigh it is doubtful how they were fastened; in after times they were secured to the tunic or doublet. Sometimes the legs were swathed or bandaged up to the knees. Edward the Confessor, who had spent many years in Normandy, returned to England a Norman in manners, and introduced Norman fashions; these consisted of hose known as *chausses* (sometimes bandaged round the legs with various colours or crossed diagonally), a sort of shirt, a tunic reaching below the knee, and a mantle thrown over it and fastened on the right shoulder or in front. The tunic and mantle were plain or embroidered or edged with fur according to the rank and means of the wearer. This bandaging, doubtless, was the origin of the cross-gartering which continued long after and is mentioned by Shakspere in Twelfth Night, "Remember who com-" *mended thy* yellow stockings and wished to see thee ever " *cross-gartered*."

In the reigns of Rufus, Henry I., and Stephen, long sleeves reaching far below the hands were attached to the tunic. Henry II. introduced a short mantle known as the cloak of Anjou, whence his sobriquet of Court-Mantle. The materials, fashions, and trimmings of the garments, rather than anything else, changed during these and the succeeding reigns of Richard I., John, and Henry III.

Edward I. set an example of plain dressing; he is reported to have declared that it was impossible to add to or diminish real worth by outward apparel, and he always dressed in a plain and unostentatious manner, little differing from a common citizen. Long gowns reaching to the heels and fastened round the waist were the general outer costume.

The reign of Edward II. presents us with the parti-coloured habits which were so fashionable during the two following centuries.

In the reign of Edward III. we have an entire change of costume, namely, a close fitting garment called a cote-hardie, buttoned down the front and confined over the hips by a girdle. The sleeves occasionally terminated at the elbows, from which depended long streamers. A mantle fastened upon the right shoulder by four or five buttons was worn over the cote-hardie. Long hose (frequently of two colours) and pointed shoes completed the dress. In this reign a law was passed regulating the materials for dress and the ornaments to be worn by different classes.

It is impossible to narrate all the varieties of fashion introduced in the reign of Richard II. The king himself was the greatest fop; Holinshed tells us that the king had made for himself a coat decorated with gold and stones and "valued at "30,000 marks." The garments were parti-coloured, embroidered with heraldic devices, family badges, &c.; the sleeves were cut in various shapes and decorated with elaborate workmanship. A description of the dresses of all classes of both sexes will be found in Chaucer's Canterbury Tales.

Laws regulating dress were passed (and disregarded) in the reign of Henry IV.

During the troublous period which began in the reign of Henry VI., until the reestablishment of peace by the death of Richard III., "the minds of men seem to have sought relief in "the invention of all that was absurd in apparel. All that "was monstrous in the past was resuscitated, and its ugliness "added to the invention of the day." (Fairholt). Sleeves of all shapes and sizes, long tight hose with feet to them, short jackets, doublets or pourpoints with sleeves slit so as to show a large, loose, white shirt, and shoulders padded out with large waddings were some of the fashions. "So capricious were the beaux, that "he who today was short-clothed was habited tomorrow down "to the ground." (Planché). Laws were enacted during the reign of Edward IV. to check some of these extravagances, but as usual without much effect. "Richard III.'s wardrobe was at "times magnificently furnished, he and the Duke of Buckingham being notorious for their love of dress and finery." (Planché). Of course the subjects readily followed the king's example.

There were dandies in the sober reign of Henry VII. Strutt remarks that it was difficult to distinguish one sex from the other, the men wearing petticoats and stomachers. Sleeves were slashed, separate from the garment, and attached to it by points or laces. Mourning habits are said to date from the close of the fifteenth century.

A marked difference in costume occurred in the beginning of the sixteenth century. Hose now began to signify breeches as separate from stockings, the upper portion being frequently found slashed, puffed, and embroidered distinctly from the lower portion. In one inventory of Henry VIII.'s wardrobe we read of *green velvet for stocks to* a pair of hose; in another of stuff for stocking of hose. These stuffed hose are called by one writer of the period cloak-bag breeches; by another they are described as bombasted like beer barrels; by another as a pair of cloth-bags. The word *waistcoat* occurs in the last inventories of this reign; it had sleeves and was worn under the doublet. There was great variety of material as well as names of garments; we find mention of coloured and embroidered cloths, velvets, satins, silks, damask, and camlet for gowns, coats, doublets, and jackets, (sometimes called jerkins), also of long coats, short coats, demi-coats, riding coats, coats with bases or skirts, walking coats, frock coats, and coats of leather, sleeves (distinct from the garment) ruffed or ruffled at the wrists, linings, facings, and shirts plaited and embroidered. A law was passed in this reign to regulate the *materials to be* worn by different classes.

Christ's Hospital was converted by Edward VI. into a school, and the dress of the boys gives us a correct description of the costume of the London citizens and apprentices of the period, namely, blue gowns and yellow stockings. The trunk hose (as the stuffed upper stocks were now called) were nearly covered by the long flaps or skirts of the coats or doublets. "A pair of long "Spanish silk hose was presented to Edward VI. by Sir Thomas "Gresham." (Planché.) Knitted hose or stockings were not yet made in England.

"The minds of the people in Queen Mary's reign were too "much occupied to study fashions, but nevertheless so strict was "the queen in her notions of apparel that severe sumptuary laws "were passed in her reign." (Fairholt.)

It may be readily supposed that fashions ran riot in the reign of Elizabeth. The courtiers vied with one another in finery, and other classes naturally followed their example. The breeches were gathered into a series of puffs round the thighs; they were enormously wide, reaching sometimes to the knees, sometimes to the gartering place below the knees where they were tied with silk points or the like. In an old ballad those folks are censured who—

Furnyshe forthe their pryde
With woole, with flaxe, with hair also
To make their bryches wyde.

Bran was sometimes used as stuffing. The sleeves of the coat being *open or slashed*, the shirt was an article of great cost. *Men wore stays.* Philip Stubs published a book in this reign entitled "The Anatomie of Abuses"; therein he strongly denounces (inter alia) the apparel of his countrymen, namely, their great ruffs, costly shirts, doublets, costly hosen, costly nether-stockings, corked shoes, pantofles, coats, jerkins, and cloaks. Rider the stocking-maker and Lee the inventor of the stocking frame lived in this reign (see under female body coverings).

At the beginning of the civil war the costume of the cavaliers consisted of a doublet of silk, satin, or velvet (or of a buff coat) with large loose sleeves slashed up the front, of a short cloak worn carelessly on one shoulder, and of breeches loose to the knees where they ended in a fringe or row of ribbons and met the tops of wide boots which also were ruffled with lace or lawn. The collar of the doublet was covered by a falling band of point lace with the edging now called Vandyke. The puritan dress may be described as a doublet buttoned half-way down the thighs, a plain falling band, a short cloak over the doublet, widish breeches, a high hat with broad brim, and boots with wide turned-down tops.

With the restoration fashion also regained its throne, and many were the pranks it played. Taste and elegance were abandoned for extravagance and folly, but perhaps the most absurd monstrosity was the introduction of the periwig, which however lasted (with various prefixes) until the French revolution. It would fill more space than can be spared in an introduction to enumerate the various habits of this reign, and the reader is referred to Pepys's diary in which he will find a description of divers suits worn by that worthy gentleman. In his entry of October 8th, 1666, we read, "The king hath yesterday in "council declared his resolution of setting a fashion for clothes "which he will never alter. It will be a vest I know not well "how; but it is to teach the nobility thrift, and will do good." On October 15th, "The king begins to put on his vest;" it was "a long cassocke, close to the body, of black cloth and pinked "with white silk under it, and a coat over it, and the legs ruffled "with black riband like a pigeon's leg." On October 17th, "The court is all full of vests, only my lord St. Albans not "pinked, but plain black; and they say the king says the pinking "upon whites makes them look too much like magpyes and "therefore hath bespoke one of plain velvet." Neckcloths or cravats were worn in this reign; "they were tied in a knot under "the chin, the ends hanging down square." (Planché). In an inventory (1679) we find "a complete suit of one material under "the familiar designations of coat, waistcoat, and breeches." (Planché). Dandies carried muffs; in a ballad describing a fair on the Thames, mention is made of "A spark of the bar with his "cane and his muff." (Fairholt.)

In the reign of William III. the coat introduced by Charles II. became the national garb; it had long skirts, flapped pockets, and large loose sleeves and cuffs. The waistcoat was nearly as long as the coat and like it had flapped pockets. The breeches were gradually narrowed down to plain tight kneebreeches tied below the knees. The stockings were drawn up over the breeches to the middle of the thighs but gartered below the knees.

In Queen Anne's reign the skirts of the coat were stiffened out with wire or buckram. The nobles and gentry wore lace neckcloths and blue or scarlet silk stockings with gold or silver clocks. As a proof that there were dandies in this reign we read of a gentleman who was robbed of "a scarlet cloth suit laced with "broad gold lace, lined and faced with blue; a fine crimson cloth "suit with plate buttons, the waistcoat fringed with a silk fringe "of the same colour; and a rich yellow flowered satin morning "gown lined with a cherry-coloured satin with a pocket on the "right side." (Fairholt.)

The costume of the middle classes in the reigns of George I. and II. was a plain coat buttoned up the front, a long waistcoat (both having capacious pockets with large flaps), a plain bobwig, a hat slightly turned up, and high-quartered shoes. The upper classes wore a fine linen shirt with lace ruffles and bosom, a coat garnished with lace and buttoned at the waist to show the shirt and cravat, black velvet breeches, a small wig having a large queue, and a three-cornered hat usually carried under the arm. About 1735 the lace cravat gave way to a black one and to a stock buckled behind the neck; these in their turn yielded to the solitaire, a broad black ribbon. In Anstey's New Bath guide, a young man describing his dress to his mother says,—

> But what with my Nivernois hat can compare,
> Bagwig and laced ruffles, and black solitaire?
> And what can a man of true fashion denote
> Like an ell of good ribbon ty'd under the throat?

The dress of 1766 is well described in this work.

In 1772 a new style of dress was introduced by some young men who had travelled in Italy and formed an association called the Maccaroni Club. The hair was dressed in an enormous toupee with very large curls at the sides; behind it was tied up into a large knot. The hat was exceedingly small. A full white cravat was tied in a large bow round the neck. A frill from the shirt front projected from the front of the waistcoat, which was much shortened. The coat was short and close-fitting, with a turn-over collar; it was edged with lace or braid and decorated with frog-buttons, tassels, and embroidery. The breeches were tight, of spotted or striped silk with large bunches of strings at the knees. Silk stockings and shoes with diamond buckles completed the dress. About the middle of the reign of George III. cloth became the general material for the coat. The skirts were unstiffened, the waists were shortened, and the cut of the present court suit was adopted. The shirt-collar appeared, and the ruffle was attached to the shirt sleeve. Soon after men wore long-tailed coats, cut away in front, and very like what was called the Newmarket cut. Then came pantaloons or tights and Hessian boots and buckskin breeches and top-boots. Short boots and loose trousers, says Planché, were "the result of the visit of the "Cossacks to London;" these with the addition of the frock coat rendered the costume more convenient and less formal, and from them may be easily traced the comfortable varieties of our modern dress.

Female body coverings.—The earliest dress of the British female appears to have been two garments, the under one reaching to the ankles, the upper one to about half-way down the thighs with loose sleeves extending to the elbows, but sometimes long enough to cover the hands; it was usually confined by a girdle and was called *gwn* or *gun*, whence the word *gown* is derived. Boadicea when haranguing the Britons is described by Dio with her light hair loose over her shoulders, having a torque of gold round her neck, clad in a tunic of several colours, and a mantle over it fastened by a fibula or brooch. Strutt asserts that in almost all the drawings of female figures there appears an inner garment with close sleeves reaching down to the wrists; this was most likely a shift.

The Anglo-Saxon women were dressed in a similar manner with the addition of a head-dress, which consisted of a veil or long piece of silk or linen wrapped round the head and neck. "This "head gear was seldom worn except when abroad, as the hair "*itself was cherished* and ornamented with as much attention as

" in modern times." (Planché.) A mantle formed part of the dress of the upper classes.

In the Norman period the change was rather in name than in garment. The gown became the *robe*, and the veil the *couvre-chef* (whence comes our word *kerchief*). The robe was sometimes shaped or laced to the figure, and down to the time of Henry II. sleeves of curious patterns were worn; some were tight to the wrist, then suddenly widened and fell to the ground. The kerchiefs also were much longer and knotted to prevent them from trailing on the ground. In the reign of Richard I. the robe lost its extraordinary cuffs; the sleeves terminated at the wrist. A girdle loosely encircled the waist.

In the reign of John we read of a *wimple*, at one time another name for the kerchief, at another a separate article worn under the kerchief. "The wimple properly so called wrapped round " the head and chin and was bound on the forehead by a golden " or jewelled fillet amongst the wealthy, by a plain silken one " amongst the humbler classes." (Planché.)

The principal change in the reign of Henry III. was the fashion of wearing the hair enclosed in a caul or network of gold, silver, or silk thread, on which a veil was worn. In this and the following reign the ladies made themselves conspicuous by extravagantly long trains and an ugly sort of wimple called a *gorget*; this was wrapped two or three times round the neck and raised on each side of the face as high as the ears, giving the wearer the appearance of suffering from sore throat or tooth-ache. "The " writers of this time speak of tight lacing of ladies." (Book of costume.)

The female dress in the reign of Edward III. was very sumptuous. Pendent streamers hung down from the wrists. A spencer or jacket faced and bordered with fur was fashionable. The cote-hardie was worn by women as well as by men. Ladies rode in parti-coloured tunics, one half being of one colour, the other of another; they wore short hoods with *liripipes* (the long tails of the hoods) wrapped around their heads, and daggers hanging from ornamental girdles. The hair was arranged in square plaits at the sides of the head; a band encircled the forehead.

" Many of the gay female fashions of the reign of Richard II. " are said to have been introduced by Queen Anne of Bohemia." (*Shaw.*) The costume of the women was as fantastic as that of the men. Their gowns, kirtles, and mantles were frequently emblazoned with armorial bearings or covered with devices and mottoes. The reader will find the various fashions fully described in the before-mentioned Canterbury Tales.

"Great uncertainty exists respecting the character of the "kirtle" (Book of costume); some suppose it to have meant the petticoat, some an under robe; although often mentioned by old authors, nothing can be correctly determined about it. See quotation below from Stubs in the reign of Elizabeth.

In the reigns of Henry IV., V., and VI. the women in addition to gowns with long trains and tightly girded waists wore remarkable head dresses; some were square, some heart-shaped, some horned, and some forked. Planché mentions a Norman writer who introduces a bishop "declaiming from the pulpit "against the fashionable follies of the fair sex whom he accuses "of being marvellously arrayed in divers and quaint manners "and particularly with high horns. He compares them to "horned snails, to harts, and to unicorns." Another fashionable head dress was a large turban of the Turkish style. "The waists "of the gowns during the reign of Henry VI. were remarkable "for their shortness." (Book of costume.)

The ladies during the reign of Edward IV. were not behind their lords in extravagance or splendour. The tall head dress continued pointed like a steeple, "sometimes three quarters of "an ell in height" (Paradin quoted by Planché), sometimes "having two large wings on each side," and covered with a piece of lawn which hung down to the ground. The laws enacted in this reign respecting dress applied to women as well as to men.

A new style of head-dress appeared during the short reign of Richard III. The horn gave way to a cap or caul which entirely confined the hair and projected horizontally from the back of the head; it was covered by a stiffened kerchief. "Stays appeared "towards the end of the fifteenth century." (Book of costume.)

The gown during the reign of Henry VII. was long, concealing the feet, open from the neck to the waist, laced together, and confined at the waist by an ornamented girdle with a long pendant in front. The sleeves were ample and tight at the wrists. On the head was worn a cap or caul from beneath which the hair hung down over the shoulders.

When we recollect that Henry VIII. married six wives in about *thirty-eight years,* we can readily imagine that ladies' fashions varied considerably during his reign. We read of two additions to their wardrobe, namely, the *partlet* and the *waistcoat*; the former was a covering for the neck and throat similar to the modern habit shirt; it was sometimes made with sleeves; it was of valuable and delicate stuff and richly embroidered; the latter was not unlike a man's waistcoat. We read also of gowns open in front showing the kirtle; of gowns of blue velvet lined with cloth of *gold*; of kirtles of purple cloth and of damask; of sleeves (on which much splendour was lavished) distinct from the dress; of ruffs; of caps or coifs now familiarized to us as the Mary Stuart; of French hoods; and of the miniver or three-cornered cap "three-square and the peaks full three or four inches from the "head." (Stow.)

The pictures of Elizabeth are so well known that it is unnecessary to attempt to describe her costume. "Her great ruff," says Planché, "rises up indignantly at the bare idea of being unknown "or forgotten. Her jewelled stomacher is piqued to the extreme, "and her portentous petticoats strut out with tenfold importance "at the slight insinuated against their virgin mistress who lived "but for conquest and display." The ladies imprisoned their bodies in whalebone to their hips; the partlet yielded to an enormous ruff, which, rising gradually from the front of the shoulders to nearly the height of the head, encircled the wearer. From the bosom descended a stomacher, on each side of which jutted out horizontally a farthingale (variously spelt), the prototype of the hoop. In the Merry Wives of Windsor, Falstaff flatters Mrs. Ford that she would become "a semicircled farthingale." The ruff was starched and sometimes supported by wires. Stubs in his Anatomie of Abuses falls foul of "this liquid which they "call starch." The gowns according to the same author were some of silk, some of velvet, some of grogram, some of taffeta, some of scarlet, some of fine cloth of 10, 20, or 40 shillings the yard, of various colours and decorated all over with lace or broad strips of velvet, some with sleeves hanging down to the skirts and trailing on the ground, some short, cut up at the arm, pointed with ribbons and "gallantly tied with love knots." Some ladies had caps reaching down to the middle of their backs faced with velvet or fine taffeta and "fringed about very bravely." Their petticoats were of the best cloth and "fringed about the skirts "with silk." "But what is more vain," he adds, "they must "*have kirtles (for so they call them)*" of silk, velvet, &c.

"bordered with gards, lace, fringe, and I cannot tell what." Their stockings were of knitted fabric (or of the finest cloth) and of various colours "cunningly knit" and "curiously indented in "every point with quirks, clocks, open seams, and everything "else accordingly." As early as the third year of this reign one Mrs. Montague presented to Her Majesty a pair of black knit silk stockings made in England. Soon after this, says Stow, William Rider seeing a pair of knit worsted stockings at an Italian merchant's borrowed them and made a pair like them which he presented to the Earl of Pembroke. This "was the first pair of "worsted stockings knit in this country." In Stubs's day we perceive that stockings of silk, worsted, and yarn had become generally worn. In 1599 William Lee invented the stocking frame. Stow informs us that Lee manufactured not only stockings in his frame, but also "waistcoats and divers other "things."

William Warner, in his Albion's England, thus describes two old dames lamenting the changes in apparel which were spreading throughout the land :—

When we were maids
Then wore they shoes of ease, now of an inch-broad-corked high;
Black kersey stockings, worsted now, yea, silk of youthful'st dye;
Fringed and embroidered petticoats now beg—but heard you named
Till now of late, busks, periwigs, masks, plumes of feathers framed;
Supporters, pooters, fardingales above the loins to wear,
That be she ne'er so bombe-thin, yet she cross-like seems four square.

"Elizabeth made more laws than any other monarch respecting "dress."—(Book of costume).

The farthingale and ruff were worn throughout the reign of James I. They disappeared during the reign of Charles I., and were succeeded by an elegant robe with rich full sleeves and a graceful falling collar edged with lace. The hair was becomingly arranged in curls and ringlets. The ladies of the republican party were distinguished by the plainness of their attire and adherence to staid and sober articles of dress; they wore on their heads a *hood or a high-crowned* hat.

The beauties of Charles II. were the reverse of their mothers in dress as in demeanour. "A studied negligence, an elegant "deshabille is the prevailing character of the costume in which "they are nearly all represented; their glossy ringlets, escaping "from a single bandeau of pearls or adorned by a single rose, "fall in graceful profusion upon snowy necks unveiled by even "the transparent lawn of the band or the partlet, and the fair "round arm, bare to the elbow, reclines upon the voluptuous "satin petticoat, while the gown of the same rich material piles "up its voluminous train in the back ground." (Planché.) Patching the face was introduced at least as early as 1680.

More delicacy was observed in covering the bosom during the two following reigns. Sleeves were made with cuffs above the elbows, and from beneath them fell a profusion of lace in the shape of ruffles or lappets; a long glove completed the envelopment of the arm. The hair was combed back from the forehead and surmounted by piles of ribbons and lace; the whole was sometimes covered by a scarf or veil which hung down on each side. This fashion of head-dress was called a *tower*, and more generally a *commode*. Rows of flounces bordered the petticoat which was disclosed by the gown being looped back.

Two changes took place in the reign of Anne. The tower or commode gave way to a natural and elegant coiffure, the hair clustering down the back of the neck in curls. This change is highly praised by Addison in the Spectator; he writes, "I re-"member several ladies who were once near seven feet high that "at present want some inches of five." The other change was the introduction of the hoop. In the month of July 1711, we find that the new-fashioned petticoat had swollen out to an enormous size, so that what the ladies "have lost in height they make up in "breadth." (Spectator.) The fashion of patching the face was carried to a great extent in this reign; Tory and Whig ladies patched on different sides of the face.

The reigns of Geo. I. and II. boast of Hogarth as their illustrator. We find cloaks with hoods termed cardinals; hoops accompanied with very long waists and tight lacing; loose gowns called sacques, open in front, hanging free of the body from the shoulders to the ground and gathered in folds over the hooped petticoat; frilled caps; high-crowned hats; gypsey hats; little bonnets tied under the chin; aprons, and masks. Patches were still much used. The hoop like the more modern crinoline often changed its shape, sometimes projecting all round, sometimes increasing at the sides and diminishing in front, sometimes almost indiscernible and then swelling out larger than ever.

In 1767, says Fairholt, the hair-dressers introduced a fashion for ladies' hair which was perhaps the most disgusting ever known. The hair with the addition of false hair and wool, pomatum, powder, pins, and combs, was dressed into a variety of shapes. Heads thus carefully and expensively arranged were not dressed frequently; and in the London Magazine of May 1768 a hairdresser is described as asking a lady how long it was since her hair "had been opened and repaired;" she answered "not above "nine weeks;" he replied "that that was as long as a head could "well go in summer."

In 1772 the Maccaroni head-dress was fashionable among ladies; they assumed the ridiculous toupee and curls. This was followed by mountains of curls, powder, flowers, and feathers, which rose above the foreheads of our stately great grandmamas. Some bore on the powdered summit a bird with extended wings and a long tail. Then for a change was worn a flat-crowned broad-brimmed straw or silk hat surrounded with ribbons while two or three immense curls fell from beneath it on to the shoulders. Powder maintained its ground until about 1793 when it was discarded by the Queen and the Princesses. Although the large hoop was towards the close of the eighteenth century worn only at court or in full dress, it was occasionally seen, extending itself at the sides; it was called a pocket hoop and resembled panniers. For the abolition of the court hoop we are indebted to George IV.

The occasional gaudiness of ladies' dresses at this time may be gathered from an advertisement (extracted by Fairholt) of the loss of "a brocaded lustring sacque with a ruby-coloured ground and "white tobine stripes, trimmed with floss; a black satin sacque "with red and white flowers trimmed with white floss; and a "garnet-coloured lustring night gown with a tobine stripe of "green and white trimmed with floss of the same colour and "lined with straw-coloured lustring."

About 1788 the ladies wore a projecting covering of gauze or linen on the breast; it was called a *Buffont*, and stuck out from beneath the chin like a pigeon's breast.

The French revolution "affected the female as powerfully as "the male costume of Europe. Fashion ever in extremes rushed "*from high-peaked* stays and figured satins, yard-long waists and "hooped petticoats, into the lightest and slightest products of "the loom, which clung round the form whether graceful or un- "gainly and were girdled absolutely under the arm-pits." (Planché). Short waists were very fashionable about 1794; they returned to a more natural length in 1798.

Gloves are of very early date. In the 24th Book of the Odyssey we read of a man wearing gloves (or perhaps mittens) on his hands to protect them from the brambles. Eustathius in his commentary on the passage distinguishes between mittens and fingered gloves. Xenophon in the Cyropaedia describes the Persians as wearing finger-sheaths in the winter. Varro informs us that the Romans wore finger-covers for the performance of certain manual operations, and Pliny the younger mentions the wearing of *manicae* to protect the hands from cold. Manicae may however mean long sleeves of the tunic reaching down over the hands.

In the reign of Ethelred the unready (at the close of the tenth or beginning of the eleventh century) a law was enacted respecting import dues; one payment required consisted of five pairs of men's gloves.

Gloves appear to have been rare among the Anglo-Saxons. We have a proof that they were worn by the upper classes in the reign of Henry I. in the account of the Bishop of Durham's escape from the Tower; "having forgotten his gloves he rubbed "the skin off his hands in sliding down the rope from his win- "dow." (Planché). Jewelled gloves are seen in the monumental effigies of the time of Henry II. Gloves, some short, some reaching nearly to the elbow, embroidered at the top and jewelled at the back (if belonging to princes or prelates) became more frequent in the reigns of Richard I. and John. In the fourteenth century gloves were usually made with long tops, and carried in the hand or thrust beneath the girdle. "The glovers' company "of London was incorporated in 1556." (Haydn's Dictionary of Dates). In the reign of Elizabeth, says Stubs, the ladies had their hands "covered with sweet-washed gloves embroidered with "gold and silver."

Stevens, in his notes on Shakspere, observes that it was anciently the custom to wear gloves in the hat on three distinct occasions, namely, as the favour of a mistress, the memorial of a friend, and a mark to be challenged by an enemy. Portia, in the *Merchant of Venice*, says to Bassanio "Give me your gloves; "*I'll wear them for your* sake." In the fourth act of Henry V., Williams replies to the king "How shall I know thee again?" K. Hen. "Give me any gage of thine, and I will wear it in my "bonnet." Will. "Here is my glove; give me another of thine." K. Hen. "There." Will. "This will I also wear in my cap; if "ever thou come to me and say, after tomorrow, *This is my* "*glove*, by this hand I will take thee a box on the year." Other allusions are plentiful. In Dekher's Untrussing of the Humourous Poet (1599) mention is made of "five or six pair of the white "innocent wedding gloves." (Quoted by Fairholt).

Head coverings. The old Briton covered his head with a cap resembling that known as the Phrygian cap; it fitted close round the forehead, whence it rose with a curve. Another cap, supposed to have been worn on state occasions and as a military cap, was conical. The hood also was a most ancient head covering; it fitted the head closely; the aperture for the face encircled the chin and forehead in a very snug manner, so as to render a cap or hat superfluous.

The Anglo-Saxons wore similar caps; they were adorned by men of quality with some kind of ornament.

The Norman cap was a flat round one like a Scotch bonnet.

During the reigns of Rufus, Henry I., nay until the reign of Henry III., we find the Phrygian-shaped cap, and a cowl attached to the cloak. "A hat appears in one illumination, resembling "the Roman *petasus*, or a modern English carter's." (Planché). In the reign of Henry III., caps of singular and varied shapes are more frequently met with. A cowl or coif was the general head-gear of the traveller.

In the reigns of Edward I. and II., a hat like the petasus was slung behind the shoulders to be put on at pleasure; it was often worn over a hood.

During the reigns of Edward III. and Richard II., caps were worn of fantastic shapes, and often carrying an upright feather. Mention is made of beaver hats. Chaucer, in the prologue to the Canterbury Tales, describes the merchant as having "On his "hed a Flaundrish bever hat." The Duke of Lancaster is represented in a tall muff-looking hat or cap.

From this time until 1483 head-coverings were various; some were low hats peaked in front and turned up at the sides and back with edges sometimes of a different colour and with a ewelled band; some were hats like a sugar-loaf, rising to a peak at the top and turned up all round; others were a sort of turban called a *roundlet,* having attached to it a long band, which either trailed on the ground, or was tucked into the girdle, or was wrapped round the neck. These bands were the before-mentioned *liripipes*; others again were small hoods tied under the chin and adorned with gold, silver, and jewels.

In the short reign of Richard III., small caps or bonnets of varied shape formed the customary head-dress; they fitted closely to the head, had rolls of fur round them, or had the lining turned up; a feather (sometimes jewelled up the stem) was worn at the back or side. The hood and peaked hat with a single feather were still worn.

With the Tudors the hood rapidly disappeared. Broad felt hats or caps and bonnets of velvet, fur, and other materials, with a profusion of parti-coloured plumes projecting sideways or drooping over the shoulder became general among the great and gay. Hats were worn so much on one side as to show on the other a portion of an under cap of network or velvet; they were frequently slung behind the back. "With the accession of "Henry VII. came a squareness and stiffness of head-coverings "for man and woman." (Fairholt). The brimmed or bordered cap, jewelled and bordered with ostrich feathers (worn by Henry VIII.), was characteristic of the head-dress of his reign. "Hattes of crimosyne velvet, hattes after dauncer's fashions with "fesaunts feathers in them, bonnettes of white velvet wrapped "in flat golde of damask, cum multis aliis, may be found "recorded in the chronicles of this time." (Planché).

The reign of Edward VI. introduced the small flat round cap called the city flat cap; it was worn on one side of the head, and still survives in the caps of the blue coat boys. Throughout this and the following reign many wore a coif (which was tied beneath the chin) and over it the flat cap.

Stubs enumerates a variety of hats and caps worn in Elizabeth's time; some sharp on the crown, "pearking up like the shaft of "a steeple and standing a quarter of a yard above the crown of "their heads;" some flat and broad on the crown; some with round crowns and bands of all colours; some without bands; all were made of velvet, or taffeta, or sarsnet, and ornamented with great bunches of feathers. He mentions also beaver hats "of 20, "30, and 40 shillings a piece fetched from beyond the sea." In 1571 a law was passed to compel persons (except nobility) to wear caps of wool manufactured in England. To this law Shakspere alludes in Love's Labour Lost, when Rosaline says "Well, better "wits have worn statute caps." There was also a hat worn by both sexes called a *thrummed* hat, "made of a coarse kind of "woollen cloth." (Malone). In the Merry Wives of Windsor, Mrs. Page says of her maid's aunt, "And there's her thrum'd "hat and her muffler too;" the latter concealed the lower part of the face.

"Some of the earlier portraits of James I. display him in hats "of fearful ugliness." (Fairholt.) In this reign we read of tall sugar-loaf hats clapped on one side of the head; of narrow-brimmed hats with flat crowns; of hats turned up with a silver clasp on the *leer* side, and of beaver band and feather for the head; in the following reign, of the Naples hat with the Rome hatband, and of tall hats with ribbon on one side and feather on the other and love-locks on each side of the head. The cavaliers wore a broad-leafed Flemish beaver hat with a rich hatband and a plume of feathers; the roundheads a high sugar-loaf hat with a broad brim. The flat cap continued to be worn in the reign of Charles I.

The enormous periwigs were a more distinguishing head covering of the reign of Charles II. than the hat. So extraordinary a head dress "demanded a different covering to the high-crowned "hat or broad-leafed Spanish sombrero. Down went the crowns "and up went the brims at the side; a row of feathers was placed "round it . . . . and the first approach was made to the cocked "hat of the eighteenth century." (Planché.)

In the reign of James II. the broad brims were frequently turned up on two sides, or, in the language of the day, were cocked; one favourite mode was called the Monmouth cock from the unfortunate Duke of Monmouth. The hat was edged with gold lace, and this with another made with a low crown almost concealed by feathers brings us to the reign of Anne, when we find long and formally curled periwigs, black riding wigs, bag wigs, and night-cap wigs surmounted by small three-cornered hats edged with gold or silver lace and sometimes trimmed with feathers. The hat was often carried under the arm not to disarrange the wig—

But now, lest weight of hat the curl should harm,
Beaux strut about with beaver under arm.

The battle of Ramilies gave name to the Ramilie cock and the Ramilie wig, which was followed in due course by the pig-tail. Other wigs were called tie-wigs and bob-wigs.

Towards the end of the reign of George II. or at the beginning of that of George III. a larger cocked hat was introduced from Germany and distinguished by the name of the *Kevenhuller.* Planché quotes the following from a writer on the subject of hats:—"Hats are now worn upon an average six inches and "three-fifths broad in the brim and cocked between Quaker and "Kevenhuller. Some have their hats open before like a church "spout or the scales they weigh flour in; some wear them rather "sharper like the nose of a greyhound, and we can distinguish "by the look of the hat the mode of the wearer's mind. There is "the military cock and the mercantile cock; and while the "beaux of St. James's wear their hats under their arms the "beaux of Moorfields Mall wear them diagonally over their left "or right eye. Some wear their hats with the corners which "should come over their foreheads in a direct line pointed into "the air; those are the Gawkies." An excellent specimen of the extreme of fashion is worn by the dissipated husband in Hogarth's Marriage à la Mode.

"About 1783 the manufacture of straw was carried to great "perfection and was introduced as an ornament to dress so much "that a correspondent of the European Magazine again wrote, "Straw! Straw! Straw! Everything is ornamented with straw "from the cap to the shoe buckle. This was the era of straw "bonnets." (Fairholt.)

The uncomfortable hat worn at the present day dates its origin from the French revolution (1789) which completed the downfall of the three-cornered cocked hat, excepting in the case of the Greenwich and Chelsea pensioners and state coachmen. A flat, folding, crescent-shaped beaver, still called the cocked hat was carried until long afterwards by beaux at the theatre and at full dress evening parties; this however was obliged to give way to the more convenient crush hat. The wig too felt the influence of the French revolution, but we did not reach our present pleasant and natural mode of arranging the hair without passing through many stages of frizzing, plastering, and powdering.

Foot coverings.—It may be fairly presumed that the earliest foot covering was the sandal as worn by the Romans, viz., a sole without any upper leather, and fastened round the ankles with straps. Such a covering was not suitable to our cold climate, and the Britons are represented as wearing shoes consisting apparently of a single piece of hide pointed and open in front so as to draw over the foot.

We are not informed whether the Britons adopted the foot coverings as well as the dress of their Roman conquerors. The Roman soldiers wore strong heavy sandals thickly studded with nails, but the officers and civilians had improved their sandals by the addition of upper leathers of "the greatest possible variety in "the form, colours, and materials." (Dicty. of Gk. and Rom. antiqs.)

The Saxon shoe was generally pointed, open over the instep, and secured by one or more thongs. "To go barefooted was a "penitentiary injunction." (Knight.)

Short boots were common towards the close of the reign of William I. Robert, his eldest son, was nicknamed "Curta ocrea, "or short boots, either from his setting the fashion or for "retaining it perhaps when abandoned by the beaux of the day." (Planché.)

Peak-toed boots and shoes of absurd shapes, some like a scorpion's tail, others stuffed with tow and curling round like a ram's horn, are mentioned and censured by the monkish historians in the reign of William II.

If we may trust Shakspere, *rights and lefts* were of early date. In the play of King John, Hubert says—

> "Standing on slippers which his nimble haste
> "Had falsely thrust upon contrary feet."

Shoes of purple fretted with gold formed part of the dress of King John, and in his reign short boots as well as shoes were worn by the ladies.

In the reign of Edward III. shoes were much and variously embroidered. Planché quotes from an old author that the men "seem more like tormentors or devils in their clothing and also "in their *shoying* and other array" than to men.

The peaked shoes reached their greatest enormity in the reign of Richard II.; they were called *Crackowes*, "resembling devil's "claws;" it is said that the points were fastened to the knees with chains of gold or silver. "We have no illumination exhi- "biting them so fastened, although the points are represented of "a preposterous length." (Planché.)

The partiality of Henry V. to short boots or buskins is proved by an anecdote in Monstrelet's Chronicles, quoted by Planché, pp. 181, 182.

In the reign of Henry VI. we find boots coming up to the middle of the thighs, short boots or buskins, and shoes with high fronts, all long-toed, and some extravagantly so. These long-toed shoes were called *Poulaines* in the reign of Edward IV.

Paradin writes:—"The men wore shoes with a point before " half a foot long; the richer and more eminent personages wore " them a foot, and princes two feet long; and when men became " tired of these pointed shoes they adopted others in their stead " denominated *duck-bills,* having a bill or beak before of four or " five fingers in length." (Quoted by Planché.) Half boots, *laced at the sides,* and clogs were now worn.

Long-toed shoes, as well as high boots, and a sort of clog fastened by a strap over the instep and vying in length with the shoe, were some of the foot coverings used in the reign of Richard III.

In the reign of Henry VII. the shoes were absurdly broad at the toes; shoe-roses of every colour (except white, the colour of the House of York), but specially of red (the colour of the House of Lancaster), became very general.

Slashed shoes and buskins of velvet and satin with very broad round toes were the fashion of the reign of Henry VIII. In the following reign the shoes were slashed across to show the coloured hose beneath. "The preposterously broad or square-" toed shoe was ousted by proclamation during Mary's reign." (Planché.)

Among the articles of dress censured by Stubs in Elizabeth's reign we read of corked shoes, pantofles, and slippers of velvet, Spanish leather, or English leather stitched with silk and embroidered with gold and silver all over the foot. Of the corked shoes he writes that they bear people up two inches or more from the ground.

Hamlet saluting one of the lady actors says, "By 'r Lady, your " Ladyship is nearer to Heaven than when I saw you last by the " altitude of a chopine." The chopine (spelt also chioppine) was either a high heel or a clog to raise the wearer from the ground.

High boots with wide tops fringed or ruffled with lace distinguished the cavaliers of Charles I.; the puritans as a matter of course wore theirs plain.

Square toes, high heels, shoe roses, and enormous ties stiffened to stand out on each side, were the prevailing fashions in the time of Charles II. The same description of shoe but buckled over the instep was generally worn during the reigns of William III. and Anne. In the latter reign we read of square-toed short-quartered shoes with high red heels and small buckles. "The ringed patten " is not older than Anne's time." (Fairholt.)

The works of Hogarth abound with good examples of the boots and shoes of the reign of George II. and the early part of George III. "The modern top-boot was in use as early as 1775, " if we may trust to a print of that year; it differs in no parti- " cular from that still worn save that it is not so elegantly made." (Fairholt.)

"In 1777 the buttons of the coats and the buckles on the shoes " were worn of an enormous size and occasioned the production " of a caricature called 'Buckles and Buttons, or I'm the thing, " deme'." (Planché.) During the latter part of the eighteenth century buckles were richly ornamented; the nobility wore diamonds in them, the commonalty paste. The large buckle disappeared about 1812; then followed knee breeches and top boots, pantaloons and Hessian boots, loose trousers and Wellington or Blucher boots.

The foregoing remarks have been extracted freely from the works of Stow, Strutt, Shaw, Meyrick and Smith, Knight, Planché, and Fairholt, and from the Book of Costume or Annals of Fashion; the pictures of Hogarth and the National Portrait Gallery at South Kensington also have been examined. The books of Meyrick and Smith, Knight, Planché, and Fairholt abound with engravings and woodcuts, which have been copied from illuminations and manuscripts and may be supposed to represent faithfully the costumes of the times. The chief difficulty has been to abridge the exhaustive works of the above-named authors, and this introduction has already run to such a length that no space is left to call the attention of the reader to the many ingenious contrivances in this and the other divisions of the series for simplifying and perfecting the inventions of our forefathers. The Phrygian cap has gradually become the cocked hat or chapeau bras and the round hat or chimney pot; the coat introduced by Charles II. passed into the wide-skirted and broad-flapped coat of William III., Anne, *George I. and* George II., and then into the modern dress-coat *(the ordinary* habit of gentlemen 30 years ago) and the top-coat;

the trunk hose lengthened into knee breeches, then into pantaloons or tights, and finally into loose trousers; the skewer for fastening cloaks was changed for a sort of pin; the pin hinged to a frame became the tongue of a buckle; when hinged to a disc (formed with a catch or sheath for the pin-point) it originated the brooch; and the disc covered or bossed formed a button-top, while the pin was bent into a shank. Some fashions are said to have owed their origin to a desire on the part of the inventor to conceal some deformity; peaked shoes to hide a deformed foot; the ruff to hide a wen, &c., &c. Men in their present, easy, comfortable dress have not recurred to any bye-gone fashions; the assertion however will not hold in female costume; each so-called novelty has been in fashion over and over again, although most probably not so elegantly made as at present. Mr. G. H. Darwin in Macmillan's magazine of September 1872 writes, "Women's " dress retains a general similarity from age to age together with " a *great* instability in details." We may therefore in conclusion apply to the ladies (we hope without rudeness) the following lines at the beginning of Middleton's Mayor of Quinborough :—

Fashions that are now called new
Have been worn by more than you;
Elder times have us'd the same,
Though these new ones get the name.

WEARING APPAREL.

DIVISION I.

HEAD COVERINGS.

A.D. 1637, February 7.—N° 102.

BERKS, Thomas Earl of.—" C'ten kilnes for the drying of " maulte, wheate, beanes, pease, oates, flaxe, hempe, yarne, hatts, " and hopps, or whatsoever graine may be dryed with fire, with " seacole, turfe peate, or any other the meanest fewell as also " of c'ten ovens and other invenc̃ons, to be used together with " the said kilnes as pte thereof or else of themselves alone, very " necessary for baking, boyling, roasting, starching, and drying of " lynnen, and divers other the like conveniences, all at one and " the same fire and at the same tyme."

[No Specification enrolled.]

A.D. 1716, February 18.—N° 403.

MASTERS, Thomas.—"A new way of working and staining " in straw, and the platt and leaf of the palmeta tree, and covering " and adorning hatts and bonnetts, in such a manner as was " never before done or practised in England or any of our " plantac̃ons."

[Letters Patent printed, 4*d.* No Specification enrolled.]

A.D. 1721, September 9.—N° 436.

WATLINGTON, John.—" A new engine for the better and " more expeditious cutting the wooll from beaver, coney, and " hare skins, in order to make hats."

[Letters Patent printed, 4*d.* No Specification enrolled.]

A.D. 1730, October 22.—N° 522.

KETTLE, George.—“A new way or method for making or dying men and women's black hatts with white or any other couloured ruffs, that the common methods of making hatts with ruffs are only black, and no other person or persons whatsoever hath discovered the invention of making or dying hatts with ruffs of any other colour.”

[Letters Patent printed, 4*d*. No Specification enrolled.]

A.D. 1748, June 27.—N° 632. (* *)

WHEELER, Joshua.—“To prepare woolen cloath and hatts so as to render them capable of keeping out much more than a day's or week's rain, without impairing either the beauty or strength of the cloath or hatts.” “Stretch the cloth in a frame, and spread on the wrong side of it as much bees'-wax as, when forced in by heat, will penetrate half through the cloth's thickness; then take one pound of bees'-wax, half a pound of yellow rosin, two ounces of Strasburgh turpentine, and melt them together, to which add as much oyl of rosemary as will overcome the smell of the above ingredients, of which spread, as before, such a quantity as will, by heat, force through three-fourths of the cloth's thickness. The same preparation, with as much ivory black as is sufficient to colour it, to be in like manner forc'd by heat, will prepare hatts for the purpose aforesaid.”

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 123.]

A.D. 1753, April 10.—N° 681. (* *)

MOLE, Keyser.—“A new method of bleaching, whitening, and beautifying of hatts, com̄only called leghorn hats, and other hatts, and the platts whereof the same are made, and also sundry other goods, wares, and merchandizes, made either of straw, chips, cane, or other materials respectively, and of restoring such of those sort of goods to their original or rather superior colour and goodness as have by any accident been stained, soiled, mildewed, or otherwise spoiled or damaged.” “Put the said hatts and goods above mentioned into a vessel that will hold them, with two ounces of salt of tartar, four ounces of *lixivious, lixivial*, or lixiviate salts of vegetables, as pot ashes,

" pearl ashes, barilla, kelp, or any other ashes or alkaline salts of " vegetables well rectified, and two ounces of flower of sulphur, " to every gallon of water; let them remain therein half an hour, " then clean them off with water and dry them. Then put them " again into fresh mixture as above, to every gallon of which add " one pint of the juice of lemmons, limes, crabbs, or other fruits " or acids of vegetables, or in such other greater or lesser quantity " or proportion, as the nature and quality of the goods, or the " deficiency of colour, or degree of damage of the goods, shall " require; for in such case the deficiency of colour and the damage " age of the goods and experience only must direct and ascertain " the quantities and proportions needful. Let them remain in " this second mixture an hour, more or less, as occasion shall " require, then take them out and put them into a sweating room " for twelve hours. When dry put them into milk or butter " milk for twenty-four hours, or longer, if the condition of the " goods shall make it necessary. If the goods are spotted, " stained, mildewed, or otherwise damaged, you must thus do " them as above twice, thrice, or four times over. Then clean " them off with water, and dry them. Then, with a brush, do " them over with a liquor made after the following manner (to " wit) take one ounce of tartar of vitriol, one ounce of barilla, " one ounce of kelp (or the like quantity of any other vegetable " salts or ashes, or more or less thereof, according to their " strength), one pound of rind or bark of mulberry tree, one " dram of smalts, indigo, or Prussian blew (first dissolved in a " spoonfull of spirit of wine), to two gallons of water, which " must be twice boiled. Then dry them and fumigate them with " brimstone. At last, to beautify them further, boyl half a pound " of isinglass in four quarts of water and a pint of the best clean " rectified spirits. Wet them with this mixture, then fumigate " them with brimstone, and put them between hot iron plates."

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 127.]

A.D. 1764, March 28.—N° 807.

MORRIS, John, **MORRIS**, Thomas, **BETTS**, John, and **BETTS**, William.—" An engine or machine on which is fixed " a sett of working needles, which engine or machine is fixed to " a stocking frame for the making of oilet-holes, or nettwork in " *silk, thread, cotton,* or worsted, as mitts, gloves, hoods, aprons,

" handkerchiefs, and other goods usually manufactured upon " stocking frames, by a method entirely new." The patentees describe their invention by means of a sheet of drawings containing references to certain parts of the machine.

The references respecting the needles are (1) centres to which the working needle bar is screwed; (2) leads into which are cast five working needles; the needles are hollowed on the under side, and the leads are screwed to the middle bar; (3) a plate to push the stitch from the working needles to the stocking needles; (4) double links screwed to the dog of the stocking needle bar; (5) the stocking needle bar stop; (6) a fore slide (with notches at the bottom) which moves every other needle; (7) back slides which move upwards or downwards, and when down press all the needles in a common presser.

Subjoined to the references is described the method of working the machine.

[Printed, 1*s*. 2*d*. Drawing. See Webster's Reports, vol. 1, p. 51; Webster's Patent Law, p. 45, also p. 126, case 14, and Supplement, p. 12; Buller's nisi prius, p. 76; Carpmael's Reports on Patent cases, vol. 1, p. 30; Collier's Law of Patents, pp. 83, 92; Holroyd on Patents, p. 54; Davies on Patents, p. 202.]

A.D. 1769, March 21.—N° 922.

DEBAUFRE, PETER.—" Engines or tools for the shaving, cutting, and preparing of wood for making of hats and bonnets of " the same sort as those which are imported into his said Ma-" jesty's [George III.] British dominions from Leghorn and other " parts of Italy." The implements are (1) a bench with a stop and a piece of iron or brass cut with teeth, screwed on, and kept steady by a pin; also a board of proper length for the wood proposed to be cut and having screwed on to its back a piece of iron, steel, or brass, sharp-edged and of the same length as the board, and on to its front several pieces of a like metal which slide between two other pieces.

(2) A gauge consisting " of the same number of teeth proposed " to be cut at one stroke;" the teeth are to be filed very smooth, " with two acute and two obtuse angles and the points resembling " the point of a lancet."

(3) A plane "with double irons screwed together;" a plane " with three irons, two screwed together, and a cutter standing " before and a groove in the plane stock;" a plane "with four " irons, two of them screwed together; a cutter before and a

" cylindrical iron behind, fixed by two screws and two steady " pins;" a cutter of fine steel "with several points chamfered " and a space between each tooth of the breadth of the split " proposed."

(4.) A tool "consisting of a piece of polished iron, flat and " even on the top, and chamfered on the edges, with a large and " strong foot or twang to be put into a vice;" a piece of polished steel riveted therein, " a little circular and nearly the breadth of " the piece of iron;" a steel bar fixed across the piece of steel and pierced with holes " at right angles with each other, of the " breadth of the splits that you have a mind to pass through;" on one end a piece " of flat brass fixed in a bridge " and a piece of metal "fixed in a joint with an iron pin and a spring under " it," and "another bridge on the opposite side upon a right line " to receive the metal piece; this piece " will take as many cutters " as your wood will allow."

(5.) A loom consisting of a frame and three rollers of different sizes, each having " a large click and spring " and " made to shift " to any distance required instead of a shuttle;" the " tackle " is made of " small wood and thread or silk that passes through glass " or brass or wood eyes."

(6.) A long piece of smooth hard wood grooved from end to end and having at one end " a flat piece of steel with two springs;" the one " holds the split," the other discharges it "when passed " through the frame;" the first spring is acted on by a string. The reed is made of " round smooth steel wire " and can be changed " so as to work both fine and coarse."

[Printed, 4*d*. No Drawings.]

A.D. 1769, October 28.—N° 936.

HODGES, JAMES.—" New-invented art or mistery of weaving " wood hatts in a loom." The loom is of the same construction as " a loom for weaving silk or cloth;" it has connected to it a treadle or treadles and "as many lambs, tumblers and pulleys " as occasion requires.

Rods of wood are cleft into " scanes," and these are cut each into from two to ten lengths by a gauge wherein are fixed blades made from watch springs, points of lancets, or penknives. The lengths " are tied into a thumb or tail " and are " fixed upon the " *back roll,*" *after* which they " are knotted and laced to the "breast roll" and "drawn into the warp of the loom one by one "with a wood or iron hook made for that purpose as in the nature "of weaving horse hair." The lengths "are to be properly "entered in a harness with brass mails to the amount of two "hundred to three hundred and no more." The work can be stopped or let out as required by "a sun and clink both made of "iron or steel."

When the hats are woven, they are pressed in a rolling press or a common hat press and afterwards scoured with soap and water; when dry they are smoked with brimstone, cut round the edges, and bound with tape or ribbon.

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 160.]

A.D. 1770, November 16.—N° 971. (* *)

VALLOTTON, Peter.—"New manufacture of stockings or "hose, gloves, mittens or mitts, nightcaps, sacks, coats, waistcoats, and breeches pieces, or pieces of any length, or any other "articles of goods of any kind, to be worked or wove upon a "common stocking or other frame, or knit with needles, "peculiarly adapted for the wear of persons afflicted with the "gout, rheumatism, palsy, or other lameness, weakness, or "infirmity."

The Specification is as follows:—

"Of waste silk, or other silk carded and spun, separate from "or with rabet or coney wood, hare wool, beaver wool, Vigonia "wool or Spanish wool, cotton wool or camell's hair, or any "other kind of wool, furr, or hair of any other animal or beast, "down of birds or fowls, as also tow, hemp, or flax, mixed, "carded, and spun, separately or with each other, and afterwards "thrown or twisted together with a thread of wrought silk or "thread of any other material, to strengthen the same; and afterwards worked or wove upon a common stocking or other frame, "or knit with needles, and made into men's, women's, and children's hose, men's, women's and children's gloves with fingers, "women's and children's mittens or mitts, men's, women's, and "children's night caps, men's, women's, and children's socks, "knee caps, scul caps, coats, waistcoats, or breeches pieces, or "pieces of any length, or any other article of hosiery prepared "and worked in the same manner. And also the various articles "*above specified*, made of common materials and in the usual

" manner, with the addition of laying upon the needles of the " stocking frame or knitting needles, with the hand, brush, comb, " heckle, or any other instrument, such kinds and sorts of wool, " hair, down, and unwrought silk, in every particular as men- "tioned above, for the purpose of making a knap within " or without or on both sides of the above articles particularly " enumerated."

[Printed, 4*d*. No Drawings.]

A.D. 1775, April 22.—N° 1096. (* *)

TRENTAM, THOMAS, and JONES, FRANCIS.—" An intire " new method of making and manufacturing double-course " frame-work stockings, mitts, gloves, caps, and pieces for coats, " waistcoats, and breeches, upon a stocking frame, in gold, silver, " silk, mohair, cotton thread, worstead, and yarn, and of carding, " shearing, trimming, and dressing such double-course frame- " work goods."

"The double-course framework is made with the following " alterations and additions to the stocking frame." A " stop pin " is fixed to each half jack piece belonging to the stocking frame, by means of a staple riveted thereto, and two small screws, which are put through a slot hole in each stop pin, " and skrew'd " to each half jack piece," " to keep the stop pins from falling too " low or rising too high by pulling the frame over the arch." The stop pins drop before the falling bar, and take it behind the heel of the jacks. A thread is laid over the needles, and the jacks are drawn. "The frame must be sunk and brought forward to " the needle heads, and the loops left there by raising the frame a " little for the sinker nebs to clear the loops. The long neb of " the sinkers must be kept within the needles, which takes the " work back in going over the arch." Into the top of the sinker bar or sinker plate " is skrew'd a small screw, with a notch in the " head," into which a small lever is made to work, being mounted on a pin, so as to " rise and fall as occasion requires." At the end of this lever is a hole through which is put a " bow wire," which passes also into a hole in the " stop pins " mentioned above, and by pressing down the lever the wire is caused to raise the stop pins and allow the falling bar to come forward. Another thread is then laid upon the needles, and the jacks are drawn for the short loops *or course*. "The stocking frame must be sunk and

" brought forward to the needle heads. The long loops are " before the face of the sinkers, and the short loops are under the " sinker nebs. The stocking frame must be thrown up to the " standards, and the stitches press'd over the long and short " loops together, and the double course is compleated."

The other operations mentioned are performed by means of shears moved by a handle, the fabric being stretched upon a cushion while operated upon; a card, "tassels," wires on which the "tassels" are fixed, a plate in which the wires are riveted, and "a plate with three holes fix'd at the top of the wires to keep " the tassels on," are also employed in carrying out this part of the invention.

[Printed, 6*d*. Drawing.]

A.D. 1777, July 14.—N° 1161. (* *)

BETTS, WILLIAM.—" A machine or engine for the making or " weaving of hose, caps, mitts, pieces, gloves, and other hosiery " goods, both ribbed and plain, in silk, cotton, and wool."

In this specification two machines are described, one being a " plain frame" and the other a "rib'd machine," and it is stated that the "two frames or machines are to be worked by hand, horse, " water, or any other power." The "plain frame" contains a " verge or dividing barr," a "presser barr under which the needles " move to be press'd" while "at the same time the edge of the " verge brings the work over the needle heads," the "presser " barr" having its under surface rounded "to receive the needle " points." There is also a "lifting barr which locks up the " fallers," the latter being "equally divided by two cut barrs or " steys," and also a "barr" which supports the fallers "when " press'd up by the lifting bar." Then there is a "slurr barr " which carrys the slur box," and forces the fallers from the supporting "barr" through the medium of treadles, and a "slurr " wheel:" "this motion forms the loop." There is "a spring " fixed behind the rafter to force the needle barr forward when " the course is finished," and there are "two pulleys and weights " to bring forward the needle bar," to answer occasionally the purpose of the spring, and the "needle barr" is drawn back by means of a strap and treadle, that "barr" being "fixed in two " centers" connected to a "hanging cheeck." There are also a " *starr, by turning* which makes the work stiffer and slacker," and other apendages, detached views of some of which are represented in the drawing annexed to the specification. One of the figures also shows a kind of cranked shaft connected to levers, one of the cranks giving the reciprocating motion to the "slurr " wheel," and the others being made to carry the needles "back- " wards to press the course," and to "lock up the fallers for " another course."

The "rib'd machine" is similar in its general features to the " plain frame," but modified in some of the details. "The upper " part of the needles lye between those of the plain frame and the " fallers whilst the plain course is work'd," and there is a " spring presser" " to press the machine needles," of which with its "catch" a separate view is given in the drawing. The " verge" is secured to a "fluted barr," "which divides the " plain part in the rib," and mounted in two slotted arms is " another presser, to be used occasionally in place of the spring " presser."

[Printed, 10*d.* Drawing.]

A.D. 1778, February 3.—Nº 1178.

BAKER, William and **BAKER, Thomas.**—" A new machine " or engine for making stockings, waistcoat and breeches pieces, " caps, gloves, mitts, purses, and all sorts of hosiery, in silk, " cotton, thread, and worsted." The works are supported on four standards and four cross bars. The principal parts are (1) " two stars to regulate the stiffness or slackness of the work;" (2) a "thread guide bar" whereon the thread guide slides "to " lay the threads on the needles;" (3) "slide-divider leads" in which the slide dividers are fixed; (4) "sliding jacks" in which "the sinkers" are fixed; (5) "pressers" in an immovable presser bar; (6) "needle dividers" fixed in leads; (7) plates to screw the leads to the needle-divider bar and pieces to support the bar; (8) two levers to lift up the sliding jacks and a "lift-up " cock to replace the sliding jacks;" (9) a "compound cylinder, " divided into four parts numbered 1, 2, 3, 4," and turned by a winch; No. 1 is fixed upon the axle of the cylinder; the other parts are moveable thereon; catches "give motions" to the moveable parts, so that "No. 1 must have made part of a revolu- " tion" before the catch thereon lays hold of a notched plate in No. 2, and so on with the others; (10) a bar to push-up the needles; (11) two pulleys over which a string passes to No. 4; (12) a pulley over which a string runs to No. 3 to carry a "draw-" back cock;" (13) two pulleys over which a string goes to No. 1 " to carry the thread guide;" (14) two pulleys over which a string passes to No. 2 "to push off the sliding jacks."

The patentees describe their "mode of operation."

[Printed, 8*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 164.]

A.D. 1778, May 16.—Nº 1192. (* *)

TAYLOR, THOMAS.—" A method for the improvement and more " expeditious manner of making lace and open work, in silk, " cotton, threads, and worsted, and, brought to perfection, an " engine or machine on which is fixed a compleat set of working " needles; and such engine or machine is to be fixed to a stocking " frame for making, by a method entirely new, lace and open " work, as mitts, gloves, caps, handkerchiefs, aprons, stockings, " pieces, and other things of that sort of work that may be worked " or manufactured upon the stocking frame."

The machine is described as being connected to "the rafter rail " of the stocking frame, to which the machine is screwed;" a " spindle barr," springs, and a " cross barr," are also mentioned as connected to the machine, one of the springs being described " as a spring from the rafter that raises the machine." A " needle " barr," carrying a number of needles, is mounted upon a " second " barr," supported upon " a centre axle on each side," so as to be capable of being turned "up and down at pleasure," a " tumbler " and catch" being employed to keep "the needle barr in its " proper positions." The "barr" carrying the working needles is capable of sliding longitudinally, and there is also "a spring " with nicks to it, answerable to the needles of the frame," and " a screw-and tumbler that moves the machine from one needle " to another," and a " pushing plate to move the loops or stitches " from off the working needles to and upon the frame needles." " Stops" are placed, to prevent the machine from "rising higher " or sinking lower than needfull," and there is a "a slide fixed to " the stocking frame to couple the needles when the machine " delivers the loop or stitch upon the frame needles." " The working needles are hollowed, so as to cover two or more of the frame " needles, whereby the loop or stitch, when pushed by the pushing " *plate from off the* working needles, is pushed upon as many of

" the frame needles as such working needle is made to cover." The patentee states that " the machine is worked with the stocking " frame to which it is fixed," and that it is performed in manner following (that is to say) :—" In working the stocking frame the " working needles of the machine go back with the stocking " frame, and then, going over the arch betwixt the frame needles, " as the frame brings forwards the machine, catches the loop or " stitch, and by rising up each working needle covers two or more " frame needles;" then with the use of the pushing plate " the " work is pushed off from the working needles to and upon the " frame needles, whereby the work is made."

[Printed, 6*d*. Drawing. See Webster's Reports, vol. 1, p. 291; Webster's Patent Law, p. 103 (also p. 126, case 26); Carpmael's Reports, vol. 1, p. 118; Davies on Patents, p. 156; Collier's Law of Patents, p. 183; Parliamentary Report, 1829 (*Patent Law*, p. 187); Durnford and East's Term Reports, vol. 3, p. 248; Billing on Patents, p. 134; and Holroyd on Patents, p. 146.]

A.D. 1779, April 3.—N° 1217.

CLARKSON, William.—" Invention of the use of an elastick or " spring adapted to or to be fitted in or with bonnets, hats, " military caps, hatbands, and other such pieces of dress for both " sexes." The spring mentioned is " a certain gum or vegetable " elastick called or known by the name of cautcheau, or gum of " Cayanne, vegetable elastic bottle or Indian rubber."

[Printed, 4*d*. No Drawings.]

A.D. 1779, November 24.—N° 1238.

HARVEY, Joseph.—" Machinery which is to be added to a " stocking frame for making of lace called Brussells or double " ground lace for shades, aprons, handkerchiefs, cap cauls, mitts, " gloves, purses, waiscoats, and shawls, and various sorts of open " work." An upper bar has fixed in it " a complete set of needle " points." At each end of the bar is screwed a wing to which is added a stay " to guide the machine when entering the work and " regulate the same when entered," also " a conductor " wherein is fixed " a draw screw " to raise or lower the bar when at work. The bar is fastened to a lower bar, and a spring screwed to the lower bar makes it move with regularity. A lever screwed to the lower bar shifts or moves the upper bar, and a screw at each end of the machine keeps the bar steady. The machine is worked by a handle screwed to the lower bar; it rides on two springs at the time of working, and it is kept from rising too high, and is lowered when required, by means of two standards having screws in them.

[Printed, 6*d*. Drawing.]

A.D. 1780, April 22.—N° 1253.

OLIVIER, JOSEPH.—" A paraplue or waterproof hat, which " will effectually keep out rain and damp." The hat is to be coated by laying on " with a flat brush first against the grain, " and then with the grain," a composition manufactured as follows:—Melt together (stirring the whole time) 1 pint of linseed oil, 2 ounces of ground ivory black, 2 ounces of ground rock indigo, and 4 ounces of beeswax. Set the mixture in the air to cool, and then grind it upon a stone " till it is almost a " fluid." The patentee recommends " to make the grain with " another brush that is not too hard."

When the coating is dry, rub in black copal varnish " with " very little in the brush;" repeat in two or three days, and then let the hat sweeten in the air.

[Printed, 4*d*. No Drawings.]

A.D. 1781, February 26.—N° 1280.

HUNT, HARRIOT BRIDGET.—" Entire new and peculiar method " of making all sorts of hats, cloaks, waistcoats, and other things " beautifully ornamented with feathers and other materials."

[No Specification enrolled.]

A.D. 1782, January 1.—N° 1312. (* *)

GOLDING, ROBERT.—" A new method of dying, staining, and " colouring beaver and beaver hats, commonly called felt or " beaver, or stuff hats, green or any other colour underneath " or on one side only." First, " the nap of the hat on the side " intended to be dyed is to be raised with a card, then boiled in " alum and argle, and afterwards a thin paste made of flour or " clay spread with a painter's brush over every part of the hat " not intended to be dyed, then closed; or they may be pasted " first, and then, instead of being boiled, must be only simmered " *in the same* liquor. As soon as the paste in either case is

" spread, plates of copper or any other metal, on thin boards, " nearly of a triangular form, or an instrument of the same " materials shaped like a common funnell, are fixed over and upon " the paste to prevent the dye coming through, and sometimes " pasted and closed together without plates or boards. Then a " small plate with the initials of the dyer's name is fixed or " fastened to that part of the hat intended for the inside crown, " which admits such initials being dyed therein at the time the " hat is dyed. In this state the hat is put into the dying " liquor boiling or almost boiling, and remains there till the " colour proposed is sufficiently fixed. It is afterwards taken " out, opened and cleansed from the paste, and if any spots have " got through they are removed by being washed with a small " mop of linen rags dipped in a strong alkali infused in hot " water; but as a yellow spot or iron mould will remain, such " spots are removed by washing them by a small quantity of " spirits of salt, aqua fortis, or vitriol infused in cold water, and " run out with a piece of board or stamper made for the purpose of making the hats clean from the filth and water after " having been dyed and washed as aforesaid. The compounds " made use of in dying are furstic, tameric, ebony, would, " safflower, sachrum, alum, argle, indigo, and vitriol, with " chamber ly or pearlash, at the option of the dyer; some- " times all used together, sometimes otherwise, according to the " intention of the dyer, according to the colour required."

[Printed, 4*d*. No Drawing. See Repertory of Arts, vol. 5, p. 98.]

A.D. 1782, November 1.—N° 1340.

CARCO, Denis.—" New-acquired and imported composition for " covering leather and all other sort of hats." First, a " com- " position of oil:"—Boil together 6 gallons of linseed oil, 1 lb. of litharge, 1 lb. of white lead, 1 lb. of red lead, and 1 lb. of amber; when " the scum rises yellow," put in 1½ lb. of white copperas and stir well.

Second, " the composition of the varnish:"—Mix gradually 4 lbs. of the composition of oil (very hot) with 1 lb. of melted copal; " when the scum rises" and the mixture " is a little cool," add 4 lbs. of the essence of turpentine; bottle and let stand till clear.

Method of preparing leather for hats :—The brim is of calf's hide "shaved on both sides." Wet it and beat it well; "black " it with green copperas and water," nail it round upon a wooden mould, and dry it by degrees in a stove for 12 hours. Mix a little ivory black with the first composition, and with a soft brush lay on as much as "the leather will take without falling off." Stove again for 24 hours "in a gradual warmth;" when cool on the mould draw out the nails, polish on both sides with pumice stone and water, rub with a wet sponge, dry with a soft cloth, and let it stand for about 3 hours in the stove room. Lay on another coat, stove again for 24 hours, polish, and return to the stove for 3 hours. Coat with the varnish, stove for 24 hours, polish with a coarse cloth and powdered pumice stone, clean with a wet sponge, and dry with a soft cloth. Finally varnish again with as little of the varnish as you possibly can, and stove again for 24 hours.

The head is to be treated in the same way as the brim, but it " must be left blocked till it is finished."

Preparation of beaver hats :—The hat is to be made without stiffening, "but worked very close and no nap on the upper side." Lay on all over it a coating of the first composition; leave it for 12 hours "in a place of a moderate warmth;" stove it for 30 hours "in a place not too warm;" polish with pumice stone, and lay on "three or four different bodies of the first composi-" tion;" when "even and free from any hair, varnish it in the " same manner as the leather ones."

The varnish may be mixed with any colour.

[Printed, 4*d*. No Drawings.]

A.D. 1785, August 4.—Nº 1494.

HANDS, SAMUEL.—"New-invented hats and caps, of copper, " tin, and other metals, japanned." The metal is "annealed " repeatedly by fire," and the crown is raised "by beating out " the same with a hammer." The brim is "flatted off" and brought into form by a like process. A wire is put round the brim, and the brim is "turned over in the same manner as other " copper and tin vessels in general." A hoop, of the height of half an inch, punched full of small holes as near the bottom edge as possible and "tinned on the outside about a quarter of an

" inch from the top edge," is soldered to the inside of the crown " about a quarter of an inch from the brim." A metal nut is " set in the front or back part" of the crown, "about three-" quarters of an inch from the brim," and a screw in the nut working against a spring of copper ("cut in the shape of a **T**" and having its foot "soldered to the top of the crown") "ex-" pands or contracts the lining affixed in the crown."

The lining consists of a piece of flannel "of the size of the " crown and placed therein," and of a piece of linen "of the " size of the crown" and "sewed through the holes or strips of " the aforesaid hoop at the bottom of the brim, and where there " is no hoop to the holes and strips punched at the bottom of " the crown."

A modification of the mode of fixing the hoop is described, likewise one of expanding and contracting the lining.

Sometimes the hat is composed of two oval pieces of copper, one for the crown, the other "for the brim and collar;" the manufacture of this hat is detailed.

If the hat is intended for female wear, three small wires are " placed on each side the brim thereof near the crown" in order " to receive strings;" or holes are punched "thro' the bottom of " the crown of the hat close to the brim, that pins may pass " through."

The hat is to be "japanned all over the outside."

[Printed, 4*d*. No Drawings.]

A.D. 1788, September 22.—N° 1670.

HOLLAND, George.—" A method of making stockings, gloves, " mitts, socks, caps, coats, waistcoats, breeches, cloaks, and other " cloathing, and linings for the same, for persons afflicted with " the gout, rheumatism, or other complaints requiring warmth, " and for common use in cold climates, and for making false or " downy calves in stockings." The patentee describes his method of carrying out his invention as follows:—" Begin the work in " the common manner of manufacturing hosiery." Having worked one or more courses, add a coating thus:—Draw the frame over the arch; hang wool or jersey (raw or unspun) upon the beards of the needles, and slide the same off their beards upon their stems until it comes exactly under the nibs of the sinkers. Sink the jacks and sinkers; bring forward the frame until the wool is drawn under the beards of the needles; draw the frame over the arch; place a thread of spun materials upon the needles under the nibs of the sinkers, and "proceed in finishing the "course in the usual way of manufacturing hosiery in the spun "materials."

Anything manufactured in this way "has on the one side the "appearance of common hosiery, and on the other side the "appearance of raw wool."

The patentee describes other two modes of fixing raw or unspun materials, but says that "the method first described fixes them "most firmly."

False or downy calves are made in stockings by a similar process "to any required form and thickness."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 15, p. 17.]

A.D. 1790, March 20.—N° 1736.

HOLLAND, GEORGE.—"A new sort of manufacture of stock-"ings, gloves, mits, socks, caps, coats, waistcoats, breeches, and "other articles of cloathing and linings of cloathing, and other "things where warmth is required, and also of blankets, carpets "and tapestry, and in imitation and to answer the purposes of "furs and skins of various kinds." 1. "Clothing and coverings manufactured with wool alone":—Having the frame on or over the arch, sink the jack sinkers. Hang wool upon the needles "by repeatedly striking a handful of it among them." Sink the "lead sinkers upon the wool." Bring the frame forward to the heads of the needles and divide the wool for the loop by drawing the sinkers hard against it. Throw up the frame and pull it on or over the arch. Sink the jack sinkers, hang another course of wool upon the needles, and proceed as before. Bring the first course over the heads of the needles, pull the frame on or over the arch, "and proceed with the next course as before directed." Stops prevent the frame from "coming further forward than is "necessary to make the loop of the length required."

2. Manufacturing with courses of wool or other raw materials and courses of spun materials alternately:—Work one or more courses of wool as before described and one or more courses of spun material, "in the method of making common hosiery," alternately.

3. Manufacturing spun materials interlined with wool, "so as "to leave the hosiery elastic":—Having worked one or more courses in the common way of making hosiery, and "having laid "the thread for another crown and drawn the jacks upon it," sink the lead sinkers, and strike wool among the needles sufficient for one course. Bring the frame forward to the needle heads; divide the wool with the sinkers; throw up the frame; press and bring the work forward over the beards and heads of the needles; this finishes the course. To sink the frame and keep it sunk while the wool is hung upon the needles, a sinking treadle is used; a cord is fixed at one end to the treadle, at the other end to the cross bar.

4. Manufacturing "doubly interlined" articles:—Work one or more courses in the common way of making hosiery. Pull the frame on or over the arch; sink the jack and lead sinkers; strike wool sufficient for one course upon the needles; bring the frame forward; divide the wool of the heads of the needles; throw up the frame and draw it over the arch; lay the thread for the interlining upon the needles; draw the jacks and sink the sinkers upon it; bring the interlining forward to the heads of the needles, and throw up the frame, leaving the interlining at the heads of the needles. "Press and bring the wool and work forward upon the "beards of the needles;" shove the work back upon the stems of the needles, leaving the wool upon the beards. Bring the work forward under the beards to the heads, "which will shove the "wool upon the interlining." Draw the frame on or over the arch; lay a thread of spun materials upon the needles; draw the jacks and sink the sinkers upon it; bring it forward to the heads of the needles; throw up the frame; press and bring the work and the interlining over the needle heads; this finishes the course. The interlining may be worked in with every course or with every second or third course.

5. Manufacturing articles coated on the outside with wool or other unspun materials:—A machine is used "such as is used in "making twilled hosiery." Take the work off the needles; hang wool upon the needles, and divide it with the sinkers. Put the work off the machine upon the stems of the needles, and draw the frame on or over the arch. Lay a thread of spun materials; draw the jacks upon it, "and finish the course in the common way of "making hosiery."

The patentee describes modifications of some of his methods of manufacturing, also his mode of preparing wool for lining hosiery, of hanging wool upon the needles, and of working short carded wool upon the stocking frame.

[Printed, 4*d*. Woodcut. See Rolls Chapel Reports, 6th Report, p. 182.]

A.D. 1791, July 19.—N° 1820.

DAWSON, William.—"An engine or machine for making, "twisting, and looping open work, bobbins, lace; and also for "making lace and open work, as mitts, gloves, caps, handker- "chiefs, aprons, stocking pieces, and other things of this sort of "work that may be worked or manufactured upon the said engine "or machine." The specification contains a very full description of each part of the machine, of the manner in which the several parts are put together, and of the action of the machine. Annexed to the specification are two sheets of drawings, one shewing the shapes of the parts, the other a front and an end view of the machine.

The principal parts shewn are (1) the front and back dividers and divider leads; (2) the needles and needle lead; "the middle "of the beards" of the needles is made flat "for the purpose of "springing so as to make it rise that it may receive the thread "clear under the beard;" (3) the thread lapper and thread lapper lead; "on the nose of this lapper is soldered a bit of pewter "brought to an edge at top and bottom for the purpose of guid- "ing the lappers clear between the needles;" the lapper is a tube, and at the mouth "the hole is wide in order that it may receive a "knot or burr on the thread without any stoppage; (4) the thread lapper bar to which the thread lapper is fastened by three plates; (5) two stay clasps screwed to the bar; (6) a flat wire guard fixed in the stays and lying over the top of the stems of the lappers "in order to guide the threads into the tubes of the "lappers;" (7) a divider bar to which the front divider leads are screwed; this bar is raised by a spring; (8) four screws which draw the front dividers farther from or nearer to the back dividers; (9) "two rapping screws" fixed to the "back divider standards" for the purpose of letting the front divider bar rise or fall; (10) sets of universal joints; (11) a bobbin box; within it are ten shelves, on each shelf are twenty-four pegs, and on each peg a bobbin; (12) a roller placed before each shelf; "the bottoms of "the five bottom rollers are placed in the centre of the bobbins, "and the tops of the five top rollers are placed in the centre of "the bobbins likewise." The bobbin box is placed at the back of the machine and screwed to the feet of the inner wood frame; (13) a lace box.

The manner in which the foregoing parts are put together and the requisite connecting parts will be found in the description of the front and end view given in the specification.

[Printed, 1*s.* 8*d.* Drawings.]

A.D. 1791, November 28.—N° 1841.

LYDE, George.—"New-invented luthern or India summer "hat." A mould "intended to give the designed form or effect "to the front part of the bowl of the hat or that part which is "intended to come immediately on the forehead" is shaped so as to sit close to the common hat block, and is made to put on or take off by screws, string, or other fastening. The mould should be "about two inches and three eighths of an inch long and "about one inch thick, to go up slantways to the luthern or "ventilating part, which should be formed about two inches "above the aperture at the band;" at the luthern it may be made "about three inches along and about half an inch thick in the "center, to round off till it comes to a quarter of an inch at the "corners," and "gradually slant away above the luthern part "until it comes to an edge and is lost."

After the hat has received the usual form on the common block, it is taken off, and the mould is secured to the block. The hat is then wetted with hot water and forced on to the block with the mould on it, and kept there until it is of the intended shape. "A greater proportion of stiffening is given to that part of the "hat which covers the mould in order to make it keep its form" afterwards. The luthern "is then cut open and smoothed down "with a hot iron." The parts of the hat which must necessarily press against the forehead are to be stuffed under the leather lining with cotton.

[Printed, 6*d.* Drawing. See Rolls Chapel Reports, 6th Report, p. 145.]

A.D. 1792, January 23.—N° 1846.

BOOTH, Joseph.—"Machine or apparatus and certain chemical "compositions for the purpose of making various kinds of woollen

" cloths, linens, cottons, silks, hair, furs, muffs, hats, floor cloths, " sail cloths, carpets, an imitation of leathers, wearing apparel " and furniture."

[No Specification enrolled. See Act of Parliament, 32 George 3, chap. 73; Carpmael's Reports on Patent cases, vol. 1, p. 182; Webster's Patent Law, p. 126, case 27; Holroyd on Patents, p. 159.]

A.D. 1792, March 2.—N° 1858.

BURN, James.—"New composition for the making of hats." The patentee makes hats "of the finest quality" with a mixture of 3½ ounces of mole fur, 2½ ounces of rabbits' wool, and ¼ ounce of Aleppo wool. He subdues "the obstinate nature of the " mole fur, so that it may incorporate with other furs," by using " a little aqua regia" corrected by "a little sweet or Florence oil " which sheaths the pungent points of the aqua regia."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 9, p. 167; Rolls Chapel Reports, 6th Report, p. 145.]

A.D. 1792, April 25.—N° 1871.

DANIEL, James.—" A machine for the more speedy felling and " making of hats." The machine No. 1 in the annexed sheets of drawings is "for first forming the hat":—The frame, feeders, carding cylinders, rollers, pulleys, bows, &c. are " part of an old " invention upon the plan of a carding machine." The bows throw the wool, hair, &c. upon a "forming cone" made of wood or metal. There is a wet cloth drawn upon this cone to keep the wool, &c. upon it, and "in the end of the cone" there is "a little " wire stick" which is "to reduce the end of the cone so small " as that there can be no hole through." A rolling cone "is " placed by the side of and turned by the forming cone," and a piece of tin or pasteboard fixed upon the top of the frame returns to the forming cone any wool, &c. " which may fly from the " bows." When the forming cone has received wool, &c. sufficient for one hat, "the cloth with the hat is taken to the hard- " ening cone." The method of working the forming cone is described.

No. 2 is a modification of No. 1.

No. 3, " for hardening the hat" :—On a brick framework stands a hollow cone of cast-iron and of the same size as the forming *cone in Nos.* 1 and 2; it is heated by a fire in the framework. A roller "runs round the cone;" it is made of heavy wood or metal; it is turned by a handle, and its upper end is connected to "two "ring joints" in a frame fixed over the cone; this arrangement allows it to be "taken sideway while the hat is put on and taken "off the cone." Four iron plates of conical form are placed round the hat to prevent the roller "from rubbing the hat while harden-"ing."

No. 4, "for planking or milling the hat":—The frame of this machine is fixed upon a "plank" of No. 5. The principal parts of the machine are three cones and a star-nut. The outside cone has "an iron axletree fastened to the end of it, which runs in the "frame" through a pulley. Inside the cone are the other two, "one covered with leather, the other lined with a cloth," and the hat is placed between them. The cone lined with cloth is full of small holes through which water from a basin in No. 5 is conveyed to the hat. "These cones will mill or plank one hat only "if the hat be very strong; if light hats, two or three will mill "better than one only." The star-nut turns on an axle in the frame; it is intended "to jolt the three cones as they turn "round."

No. 5, "for ruffing the hats":—"A holder made of iron with "a mouth to hold the hats" is made fast to one end of a crank which lifts it up and down. The hats (one, two, or three at a time) "after the beaver, &c. is laid upon them by hand" are placed in the holder, and being worked up and down by the crank end and watered from a basin through a pipe, "the beaver, &c. "is shaken fast" to them. The "plank" on which the hats are milled and ruffed has connected to it a trough which conveys the water fallen from the hats into a pan. The water is heated in this pan, and raised therefrom by a pump into the before-mentioned basin.

No. 6, "for stiffening the hat":—This consists of (1) a square frame, (2) a case for holding the hat and placed in the middle of the frame, (3) a brush "with a hole in the top" which lets glue into the brush and thence through the bristles on to the hat. The case is turned round by means of a pulley, and the brush "is "slided up the frame" while the hat is being put in or taken out.

No. 7, "for finishing the hat":—A block on which the hat is secured is carried by a frame and turned by means of a pulley. Around the block is a frame carrying a case which is made in four quarters, one being of iron, one of wood "lined with hair, shagg, " or velvet," and one a brush. "The iron is made hot, and the " brush is wet" before the parts are joined together.

[Printed, 1*s*. 4*d*. Drawings.]

A.D. 1792, May 3.—N° 1874.

PRIMEROSE, Andrew.—"A new method of manufacturing " all sorts of feathers into men and women's hats, head dresses, " muffs, tippets, and shoes." The feathers are prepared "by " blanching them in sower milk mixt with allum and pearl ash," and then by washing them with hot water, common soap, and Prussian blue. After this, says the patentee, "I clasp them " between my hands before a strong fire, which restores them to " their original form."

A skeleton of a hat is made on a hat block by covering white paper with a small network, sewing on a brim, and shaping the extremity of the brim by aid of cap wire. The prepared feathers are woven into the network and fixed with a composition of ½ lb. of gum arabic and ½ lb. of gum dragon dissolved in a quart of water mixed with 4 ounces of finely pounded Spanish whiting. The ingredients should be slowly boiled together, stirring gently the whole time; when the composition is cold, "it is immediately " fit for present use and will continue so for any length of time." The hats are finished off with a silk or linen lining.

The other articles are manufactured in the same manner.

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 185.]

A.D. 1792, June 12.—N° 1888.

BOOTH, Joseph. — "Machine or apparatus and certain " chemical compositions and processes, for the purpose of making, " manufacturing, and compleating in a manner entirely new, " various kinds of woollen and other cloths, linens, cottons, silks, " muffs, hatts, and other parts of wearing apparel, floor cloths, sail " cloths, carpets, an imitation of a substitute for leather, particularly " adapted for making of ladies' and gentlemen's gloves, and a " great variety of other articles."

[No Specification enrolled. See Carpmael's Patent Cases, vol. 1. p. 172; Holroyd on Patents, p. 159; Webster's Patent Law, p. 126, case 27.]

A.D. 1794, January 16.—N° 1976.

TILSTONE, Joseph.—"New-invented material article in the "making of hats." This invention relates to the employment of the hair "from kid's skin or kid hair." If the hair is taken off the skin with lime, it will require washing in water or beating, otherwise not.

The hair when dried in the air or in a kiln may be made into hats, either alone or mixed with wool. The process is the same as that pursued in making felt hats.

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 1, p. 1; Rolls Chapel Reports, 6th Report, p. 189.]

A.D. 1794, November 11.—N° 2022.

DUNNAGE, George.—"Waterproof hats in imitation of "beaver." A shag is to be woven "of such count in the reed, "and cut over such sized wire, as will give the hats to be manu-"factured from it that degree of richness or appearance of fur "which may be thought necessary." Those materials will answer the purpose best "which are made with two poles, either "of bergam, Piedmont, or organzine silk, rising alternately in a "reed of about nine hundred count to eighteen inches wide with "three shoots over each wire." The shag should be stretched on a dyer's frame, and the pile being set upright with a comb, the ground is to be gone over with thin size; for white or any light colour isinglass should be used or a size made from white kid leather. When the size is dry, the pile must be carded with a fine card "till the silk is completely taken out of the twist or "throwing," when it is to be again set upright for the purpose of laying on the waterproof material. The material is composed of "linseed oil well boiled, with the usual driers, and thickened "with a small quantity of any good drying colour," but for white or very fine colours, of "poppy or nut oil, or copal or other "varnishes." When the first coat is dry, apply a second and a third if necessary, so that the pores of the ground may be completely filled up. When the smell is gone off, and before taking off from the frame, all greasiness must be removed with ox gall or lime water.

The shag is now ready for hat making. The crown "should "be made over a block with a needle and silk, the oiled side "downwards." The seams should be flattened, and "the edges "of the stuff pared off very near the stitches." The seams should be "carefully gone over with the prepared oil." The crown is then to be turned and stiffened by sticking to the inner side any suitable substance. The mucilaginous matter used for sticking consists of 1 lb. of gum arabic, 1 lb. of starch, and ½ lb. of glue, boiled up with water sufficient to form a thick paste.

Directions are given for making and joining the other parts, likewise the slight modifications required for "ladies' hats of "bright and fading colours."

The hats are dressed "in the same manner as those commonly "called felts."

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 4, p. 302.]

A.D. 1798, May 3.—N° 2234.

BOILEAU, Peter.—"A new and improved manufacture of "straw into hats and bonnets and other articles, in a manner and "to produce an effect never before attempted." The following are the directions given for the manufacture of a hat. Separate the straw at each joint, take off the outside skin, point one end of each "that it may be inserted into the hollow of another as it "is worked," and plunge it into water to take off its brittleness, &c.

On the top of a mould (of the shape of the crown of the hat to be made) describe a circle from the centre of the top, and from that circle draw "perpendicular, serpentine, diagonal, or other "lines or curves," which are to form "the ribs or separations of "the work" when complete. At the points where the lines touch the circle fix a nail or pin and fasten thereto "a double "wire" which must be "twice the length of the line" and fastened "just in the middle" that there may be "two equal ends of wire "to work." Begin working "by introducing the pipe or quill "straw betwixt the two wires, which wire must be drawn tight "and even with the line or curve." Repeat at every line or curve round the block; introduce the pointed end of one straw into another "just at the line or curve," and "continue thus to the "bottom of the block."

To make the brim draw on a sheet of pasteboard a circle "formed by the bottom of the crown" and lines or curves as before, and "make two small holes at the top of the lines or curves "on the circle, through which pass the wire and tie it in the same "manner as to the nails or pins." The brim when finished is to be sewed or otherwise fixed on; or "it may be continued to be "worked on the pasteboard to the crown" so that the hat "shall "be all in one piece." Fix in the space left by the circle at the top of the crown "a device of straw or other ornament," and likewise "round the edge of the brim."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 11, p. 97; Parliamentary Reports, 1829 (*Patent law*), p. 191; Rolls Chapel Reports, 6th Report, p. 147.]

A.D. 1798, November 27.—N° 2273.

DUNNAGE, George.—"A new manner of ventilating the "crowns of hats." The "tip or top crown" is made separate from "the side crown;" they are united by means of "springs, "slides, staples, sockets, grooves, loops, and cases, or some or "any of them," so that the top crown may be partially or wholly raised or shut down at the pleasure of the wearer.

The slides are of whalebone, metal, or any suitable material; they are two-sided, forming a right angle; the sockets are of thin metal and made with "a notch or slit in the sides," so that, when one side of a slide is passed through a socket and the end of the slide is crooked or turned up, the slide cannot be entirely drawn out on raising the top crown.

The sockets (generally four in number) are sewn to a fillet or hoop of stiff linen, canvas, or other substance which is secured inside the side crown near the top edge, and the upper side of the slides is secured to the under side of the top crown.

Sometimes six or eight slides are used, and sometimes the lower side is passed through a piece of tape, canvas, &c. on the hoop instead of through a metal socket.

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 10, p. 149; Rolls Chapel Reports, 6th Report, p. 194.]

A.D. 1798, December 24.—N° 2283.

OVEY, Thomas and JEPSON, John.—"A new or improved "method of manufacturing hats." A thin piece of coarse felt of the proper size for a hat is napped with a proper quantity of napping on "the under part or wrong side of the brim," and a thin piece of finer felt of the same size is napped with a proper quantity of napping on "the tip and right side." The two pieces are blocked and dried, and the nap is raised "in the usual way;"

the fine one is then put on the coarse one, and they are dyed together. The coarse one is then stiffened, put into shape and rubbed over with cement; the under side of the fine one is carded all over and rubbed all over with the same cement. The fine one is now placed over the coarse one and confined at the band; the two are pressed all over with a cool iron, and when stuck together and dry are finished off into a hat in the ordinary manner.

The cement is composed of 1¾ lb. of flour, 3 quarts of water in which 1 ounce of alum has been dissolved, and 2 ounces of very finely pounded and sifted resin; the resin is to be added while the flour and water are boiling, and the whole is to be well stirred until the resin is dissolved.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 13, p. 373; Rolls Chapel Reports, 6th Report, p. 147.]

A.D. 1799, June 6.—N° 2317.

CHAPMAN, Thomas.—“A new improved method of taking or “getting off the wool or furr from seal and other skins in a more “perfect state than has hitherto been done, for the purpose of “manufacturing the same into hats or any other article of clothing “whereby the skins or pelts are less damaged than by any other “process yet adopted, and are kept and preserved in a perfect “state for the purpose of tanning into any kind of leather.” The raw skin is soaked in “clean cold fresh water” for about 12 hours; it is then put on a beam and scraped until “the blubber or oily “substance” is removed, when it is washed very clean in water “made as warm as the hand can bear it” and containing about 3½ lbs. of soap and 2 lbs. of pearl ash for every 14 pails of water (each pail holding about 2 gallons). The skin is then dried on hoops, again washed “in the aforesaid composition made afresh “and as hot as before,” and again scraped until the coarse hair is removed. The next process is to soak the skin for 12 hours in warm water wherein has been dissolved soap 3 lbs., pearl ash 1½ lb., barilla from 1 to 2 lbs. for every 14 pails of water. A third scraping will remove the remaining hair or fur, leaving the skin “in nowise injured.”

The fur is put into a hair-bottomed sieve and immersed in a vessel containing 14 pails of water warm enough to dissolve 3½ lbs. of soap and 2½ lbs. of pearl ash; it must be frequently stirred about and pressed with the hand or otherwise for about 5 minutes. It is then thoroughly washed in warm water, dried, pulled apart, and bowed "with the bow string or other like instrument."

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 11, p. 374.]

A.D. 1800, May 8.—Nº 2399.

SIMPSON, Edward and ISBESTER, Caleb.—"A new and "improved manufacture of straw plat made of split straw, pre"senting only the outside surface of the straw to the eye, and "also of other plat or split straw, laid, put, or stuck upon silk, "paper, or wood." To effect the first part of the invention "split and fold" the straw "to the size wanted," when "the "outside surface of the straw only will present itself to the eye;" make the straw into plait. For the second part, "split and open" the straw and stick it with suitable adhesive substance on silk, paper, or wood; then "cut the same into any size slips which "may be wanted, and make the same into plat."

[Printed, *4d.* Woodcut. See Repertory of Arts, vol. 15, p. 19; Rolls Chapel Reports, 6th Report, p. 197.]

A.D. 1801, April 27.—Nº 2490.

BICKNELL, William. — "New and improved method of "covering of felt for the making of caps and helmets, and for "various other useful purposes." Undyed felt is formed to the size and shape required, stiffened inside with glue, blocked and dipped once or oftener into a cauldron of boiling composition until the external surface is coated equally over to the thickness of about one-eighth of an inch. The composition consists of 25 lbs. of resin, 1 lb. of beeswax, and 1 lb. of pitch, boiled or simmered together.

When the cap or helmet is nearly cool and dry, the external surface is flattened or smoothed "with any proper tool" and well rubbed with a sponge dipped into a boiling hot dye of 12 lbs. of logwood, $\frac{1}{4}$ lb. of copperas, $\frac{1}{2}$ lb. of glue, and 1 lb. of lampblack boiled together in about 8 gallons of water.

The cap or helmet is then dipped into a cauldron of boiling liquid composed of equal quantities of the best beeswax and finely sifted ivory black; when it is cool the surface is smoothed and polished with tools or by the friction of a lathe.

[Printed *4d.* No Drawings. See Repertory of Arts, vol. 5 ((second series)), p. 161.]

A.D. 1801, May 2.—Nº 2497.

PRITCHARD, William, and WILLMORE, Thomas.—"A " new article for the use of hats, soldiers' caps, helmets, &c." These hats, &c. are made by preference of paper and leather, although other materials may be used. The process of manufacture is as follows :—Grease the block and paste over it a covering or two of paper; dry in a stove of moderate heat, and paste or cement on the paper a covering of leather. Dry as before and add coatings of paper or leather until a sufficient thickness is obtained. Dry again until the whole is "as dry as the materials " in their original state;" remove it from the block and dip it into a composition of oil and umber boiled together and mixed with spirits of turpentine or tar spirits. Dry it again and dress it with a suitable tool or in a lathe; then black it with lampblack and spirits of turpentine or any other blacking ; dry, japan and dry again. Dress it a second time, varnish as often as may be necessary to obtain a smooth surface, rub it down with pumice stone or sand and water, varnish again (dry between each varnishing), polish it "and finish it with rotten stone ready to be " fitted up."

This article may be used for the inside of a beaver or felt hat or hunting cap.

[Printed, 4*d.* No Drawings.]

A.D. 1801, November 3.—Nº 2547.

WALKER, John, and ALPHEY, Godfrey.—"Manufacturing " caps and hats, and rendering them perfectly waterproof, as also " all kinds of leather, silk, linen, cotton stuffs, pasteboard, and " other manufactures and substances, for the purpose of being " worked up into boots, shoes, gaiters, women's hats or bonnets, " and other wearing apparel, so as to be used on all occasions " where a power of repelling wet or moisture may be required." Caps, "principally intended for the use and wear of the military," are made of pasteboard covered on both sides with linen cloth or other woven fabric. The cloth is glued or pasted on; the cap is cut out and shaped on a block, and the joinings are united by sewing, gluing, or pasting, and strips of leather or of woven fabric cemented over them on both sides. The cap is painted on both *sides with oil paint* or oil and lampblack, and when the paint is dry, a coat of japan or varnish mixed with lampblack or ivory black is added. The peak "together with the cape behind" is painted and japanned or varnished in like manner.

Ordinary hat bodies are made in the same manner and of the same materials. "Such breadth is given to that side or inner "part or edge of the flap or rim that is next the crown as will "admit of its being inched or notched and turned up so as to "lie close to the side of the crown;" it is united thereto by sewing and cement. "The parts so turned up" are covered with leather or woven fabric, and the whole is painted, japanned, or varnished on one or both sides.

Boots, gaiters, women's hats or bonnets, &c. are rendered waterproof by painting and japanning, or varnishing "in like "manner as the caps."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 16, p. 217.]

A.D. 1802, May 18.—N° 2619.

COLE, Richard.—"A machine to produce an effect by per-"foration of the articles commonly called and known by the "names of Leghorn chip and willows manufactured for hats, "bonnets, bonnet bands and other ornaments; the effect so "produced is to ornament the said Leghorn chip and willows, either "in borders of various patterns, or all over the same." The machine consists of "a hat plate of brass or other metal" and metal pins or points projecting from the plate and so sharp as to perforate the chip, &c., "without taking away any part of such "article." The chip, &c., is placed upon the points, and over it is put flannel or other soft body "so as to suffer the pins to "penetrate without injury to the pins." The whole is then passed between rollers. The plate should be warm, and to prevent the chip, &c., from sticking thin silk should be put "between "the plate and the article," and the chip, &c., should be damped.

[Printed, 4*d*. No Drawings.]

A.D. 1804, May 19.—N° 2765.

SIMMONDS, George.—"A method of manufacturing hats, "bonnets, and other useful articles of paper, and of rendering "the same waterproof when required." Sheets of paper are cut into strips, and the strips are woven, matted, or plaited "into "sheets or squares after the manner of cane or chip, or into the "form or shape of the article required." The strips are bound together with a coating of spirit varnish. If the hat, bonnet, &c., made of the strips is to be rendered waterproof, it is made so by being coated several times with spirit varnish.

Instead of making hats, bonnets, &c., from squares, the strips may be plaited into narrow plaiting and be sewn together into shape "after the manner of straw or Leghorn plat." Spirit varnish is to be applied as before-stated.

All the articles which are to be rendered waterproof, says the patentee, "I heat and clear off after the manner of drawings on "paper that are varnished."

[Printed, 4*d.* No Drawings. See Rolls Chapel Reports, 6th Report, p. 202.]

A.D. 1806, October 30.—Nº 2985.

BOWMAN, Robert.—"The means of making hats, caps, and "bonnets for men and women, of whalebone, harps for harping "or cleaning corn or grain, and also the bottoms of sieves and "riddles, and girths for horses, and also cloth for webbing fit "for making into hats, caps, &c., and for the backs and seats "of chairs, sofas, gigs, and other similar carriages and things, "and for the bottoms of beds, and also whalebone reeds for "weavers, &c." For the manufacture of hats, caps, and bonnets, either of the two following processes may be adopted.

1. The whalebone is rendered soft and flexible by heat in any convenient manner, and whilst in that state it is cut into breadths "such that one breadth may answer for the sides, one for the "crown, and one or more pieces for the brim." The pieces "after being rasped, filed and scraped" are brought into form "by working them on a block;" either the whalebone or the block must be kept warm during the shaping. The joinings are united by sewing or cementing or "soldering with parts of itself "as is done in manufacturing articles of tortoiseshell." The articles made may be finished off "with sandpaper, powdered "charcoal, burnt cork, &c." and be varnished with copal or other elastic varnish.

2. The whalebone is heated, split into strips, and plaited like straw or chip. The manufacture of the plait into hats, bonnets, &c., is the same as that pursued in straw-bonnet making.

[Printed, 4*d.* No Drawings. See Repertory of Arts, vol. 11 (*second series*), *p.* 411; Rolls Chapel Reports, 7th Report, p. 103.]

A.D. 1807, January 29.—N° 3003.

HANCE, William.—"A method of rendering waterproof beaver "and other hats."

The crown is made of "a thin shell" of "wool, hair, and fine "beaver," and the brim of "a shell or plate of the same materials." The parts are dyed and finished "without any glue "or stiffening of any sort." Or a thin shell in the shape of a hat may be "blocked deep enough to admit of a brim being cut "from the crown." Or the whole of the hat may be formed from one shell, but the patentee prefers "the outer shell to be in "two parts."

"The underneath side of the shell and the inside of the crown" are made waterproof by coating them with size, paste, &c., "sufficiently strong to bear a coat of copal varnish" and when thoroughly dry a coat of "boiled linseed oil very strong." A willow or cotton body is cemented into the inside of the crown; the whole is put on a block, left on it until dry, and then finished off with a hot iron.

The brim is cemented to some material "sufficiently thick to "make the inside of the brim;" it is put into a press, and "when "pressed sufficiently it must be hung up to harden;" then the "underside is "covered with another shell of beaver" or "silk "shagg" or "other fit material."

The crown and brim are put on "a small block to form the "brim and crown" and are sewn together. "The edges of the "brim must be oiled and varnished with copal varnish and boiled "linseed oil very strong as before sufficiently to prevent any rain "getting in."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 10 (*second series*), p. 423; Rolls Chapel Reports, 7th Report, p. 196.]

A.D. 1808, March 26.—N° 3121.

THOMAS, Anthony.—"Method of manufacturing hats, bon-"nets, and other articles of the like description." The patentee carries out his invention by means of a machine of the following structure:—A stand supports a hollow pillar. On the top of the pillar is fixed upright a hollow cylindrical piece having at its top a flange which is perforated with a series of holes near its outer edge. A block, "formed of pieces capable of "being *put together* or taken asunder" and fixed when in use on an upright stem, can be raised or lowered within the hollow pillar by a rack and pinion "or by any other similar well-known " means." Two rings move easily by means of a treadle up and down the cylinder; they are so connected by strings which pass over pulleys, that whenever one ring ascends the order descends. Upright or nearly upright wires are jointed to both rings; each wire terminates "at the same height above in a kind of loop." These wires "are so numerous as to occupy the circumferences of " the rings," whence they pass upwards through the holes in the flange alternately, that is to say, a wire from one ring is to be " interpos'd between every two such immediately adjacent wires" from the other.

The pieces of chip, &c. intended to form the warp are disposed " in radial situations from the centre of the block;" they are passed respectively through the loops; their ends "hang down " and are kept in a proper tension by small weights." The rings worked by the treadle perform the same office "as is usually per- " formed by the healds" in common looms. The weft is passed between the warp by means of one or more shuttles, and is drawn home between each alternation of the treadle. The rest of the manufacture is described.

[Printed, 6*d*. Drawing.]

A.D. 1808, July 11.—N° 3150.

BROWELL, James, **JACKS**, James, and **LERMITTE**, Thomas.—" New chemical preparation for the purpose of preserv- " ing from destruction by mildew, rot, or fermentation, all kinds " of woollen and vegetable substances from which woollen, cotton, " and linen cloths, canvas, paper, and other manufactures are " made; and also for rendering all sorts of woollen, cotton, and " linen cloths, canvas, silk, leather, hats, and paper impervious to " rain."

[No Specification enrolled.]

A.D. 1890, April 3.—N° 3222. (* *)

WILLCOX, Richard.—"Sundry apparatus or machinery for " accellerating the manufacturing of felt or stuff hats, and for " cutting and removing by machinery the furs of beavers, of " rabbits, and the whole variety of skins, the furs or wool of " *which is used for* the purpose of hat making." This invention consists, first, of a method of holding down the fur or wool during the operation of cutting, and also of removing it when cut. As the skin is advanced to the knife on a roller in the ordinary manner, the fur is held down by an apparatus called a "drag," which is disposed in a position parallel with, or inclined to the axis of the large roller, on which the skin is advanced, and is constructed so as to produce an even pressure and accommodate itself to the varying thickness of the fur. To effect this an edge bar is used composed of three parts; two form a case "somewhat similar to that of a pocket comb;" the third or middle piece projects below the other two about five-eighths of an inch, and is riveted to them at both ends. By this means the middle piece will spring on its edge, and so accommodate itself to those skins which are thicker in the middle than at the edges. To remove the fur when cut from the drag a rake is used "formed " either on the principle of the drag, or in other cases a piece of " steel, or steel and iron, placed edgewise and brought to a knife " which is afterwards a little taken down by a file or fine grit- " stone."

"The machinery to work the drag and rake may be any of the " well-known eccentric motions, as cranks, heart wheels, &c., " and connected by any of the well-known methods of commu- " nicating motion to different shafts. The effects of this appa- " ratus are that at each stroke of the engine the edge of the rake " comes into contact with the edge of the drag, and presses on " the skin so as to relieve it in some degree from the weight of " the drag (and in some cases the entire weight), and as the rake " recedes by the eccentric motion, draws away the fur cut off. " The drag now presses on the fur while a second stroke is made, " and another portion of fur cut, while the rake is raised by its " machinery sufficiently high in its back stroke to be clear of the " fur, and fall the next stroke in contact with the drag as before, " and is again ready to draw away the fur about to be cut." Instead of the rake an endless web passing over a series of rollers may be used, and made of canvass or any other suitable material to which the cut fur will adhere.

This invention also refers to an apparatus for plucking furs. The skin is disposed on a cylinder and fastened to it by one edge; it is then passed over a bar above, and hangs over the front of the cylinder. The operator plucks with both hands, using a two-handed *knife*. The invention also refers to a machine by which the fur may be cut without using any apparatus to hold down the skin. The skin is attached by one of its edges to a roller. A circular knife traverses the length of the roller on a moveable carriage, and on the carriage is an arm supporting a small piece which confines and the same time tears the fur off the pelt as fast as it is cut on to a creeper on which it is locked. It also refers to an apparatus for holding down the fur on the roller. This is effected by means of two small cones so disposed as to be in contact with the surface of the roller and also with that of a plate. They press moderately on the fur by the action of a spiral spring, and revolve on their respective axes separately by bevel gear affixed to their bases. The apex of each cone is supported by a projecting piece. The corresponding bevel wheels are set in an upright shaft driven by a wheel or other usual contrivance.

[Printed, 8*d.* Drawing. See Repertory of Arts, vol. 18 (*second series*), p. 193; Rolls Chapel Reports, 7th Report, p. 108.]

A.D. 1809, April 3.—N° 3223.

WILLCOX, Richard.—" Machinery for facilitating the manu-" facturing of stuff, wool, and other hats and bonnets felted."

[No Specification enrolled.]

A.D. 1810, September 7.—N° 3375. (* *)

DYER, Joseph C.—(*A communication.*)—" A machine for cutting " or removing all the various kinds of furs which are used in hat-" making from the skins or pelts, and for cutting the said skins or " pelts into strips or small pieces." In the frame of this machine is hung a large drum-shaped wheel turning freely on its axis. It is composed of two metal wheels, on the peripheries of which a rim of wood is securely fitted. This wooden rim " is divided into equal " spaces on each side round its circumference, and grooves cut " therein extending from its opposite sides towards its centre, so " as to diverge a little from the line of its axis, and thereby form " angles with each other and with the axis of the said wheel." In these grooves cutters made of steel are fitted so as to project from the smooth surface of the wood. Across the machine in front of the drum wheel extends a knife made of a straight plate of steel, its edge being parallel to the axis of the wheel. It is fitted in a frame, which allows of its moving freely backward and forward from the wheel, to which it is kept steadily pressed by springs fastened behind it. Above the straight knife are the feeding rollers, which revolve once while the drum wheel revolves seven times. "The skin or pelt intended to have the fur cut or " removed therefrom must have one end of it placed between " the said feeding rollers with fur side downwards, and the " drum wheel being made to revolve the skin will be advanced " to the drum wheel, so that its end will be carried just over the " edge of the straight knife, where the said cutters in the said " wheel will meet it as aforesaid, and cut off such part of the " skin as shall have advanced beyond the edge of the said knife, " and at the same time the fur will be left on the back side of " the knife as the skin is thus cut off and carried away from it " by the action of the said cutters against the straight knife."

As the edges of the cutters and knife are brought into contact by the revolution of the drum wheel, they form acute angles with each other, and being pressed together by the action of the springs on the knife they cut the skins on the same principle that the blades of shears act in cutting. And the revolution of the feeding rollers being so much slower than that of the drum wheel, very little of the skin will be presented each time to the cutters, and the skin will be cut into thin strips. A curved plate is fastened to the knife frame to receive the fur as it is cut off.

[Printed, 8*d*. Drawing. See Repertory of Arts, vol. 19 (*second series*), p. 321; Rolls Chapel Reports, 8th Report, p. 82.]

A.D. 1810, October 15.—N° 3397.

FRASER, JOHN.—"Certain vegetables and a way of preparing " the same so as they may be usefully employed in the manu" facturing of hats, bonnets, chair bottoms, and baskets, and " for other articles and purposes." The patentee utilizes the leaves of "the different species of the palm tribe of plants," giving preference to those of "the genus areca and corypha." The leaves are gathered before they are "of natural growth," and are hung up in the air in the shade to become "well bleached " and dry." They are prepared for use "by cutting off more " or less the outer extremities where the leaves taper and are " thinnest, and from the inner extremities where the material is " most stiff;" the various portions are divided into longitudinal slips which are to be sorted for their "several particular uses."

Sometimes the leaves (previous to cutting) are washed with soap and water, and after rinsing are exposed "in a moist state "to the fumes of burning sulphur in a close chamber."

The leaves may be dyed by the usual processes "either in their "first state or in any of the subsequent states."

The slips are used "by platting, weaving, or interwining the "same, with or without the addition or intermixture" of silk, wool, cotton, &c., &c.

[Printed, 4*d.* No Drawings. See Repertory of Arts, vol. 19 (*second series*), p. 329.]

A.D. 1812, May 5.—N° 3561.

DOLLMAN, Thomas Francis.—"An elastic round hat, which "may be made of beaver, silk, or other materials." "The top "of the crown and about half an inch from the top" as well as "the brim and about an inch up the crown from the bottom" are stiffened in the ordinary manner. The rest of the hat "is "left entirely without stiffening," and is kept in shape by ribs of any suitable material "fastened horizontally to the inside of "the crown," and by an elastic steel spring from three to four inches long and nearly half an inch wide "sewed on each side of "the crown in the inside in an upright position." When packed up for travelling, "the double ribbon fastened under the band is "to be pulled over the top of the crown to keep it in a small "compass."

[Printed, 4*d.* Woodcut.]

A.D. 1812, May 5.—N° 3563.

BURROWS, Bassett.—"An improved method of manufac-"turing waterproof hats." The hats, "commonly called stuff "hats," are made in the ordinary way, "with the under side of "the brim not napped;" they are blocked on "round crown "blocks" and are dried in "the usual stove." When taken off the blocks they are stiffened with a mixture of about one quart of sprits of wine and about one lb. of shellac. The mixture is made in a vessel which is placed in boiling water, and the ingredients are stirred until they are properly united; it is to be used cold, and must be well rubbed into the crowns and brims, care being taken "that it does not come through on the napped "*sides,*" *although it* "must be so rubbed in on the under sides

" of the brims as to remain as clear on the surface as possible." The hats are then dried in the stove and taken thence " to the " plank " and beavered on the under sides. After this they are blocked very tight, carded, dyed, steamed, and finished in the usual manner.

[Printed, 4d. No Drawings. See Rolls Chapel Reports, 8th Report, p. 91.]

A.D. 1813, May 31.—N° 3703.

OLIPHANT, JAMES.—" A new method of making or manufac-" turing military caps." When the cap is planked and ready for blocking it is put upon a block, the shape of which is represented in a woodcut in the specification. The cap is then dyed and stiffened and afterwards steamed upon another block, " the tip of " which is perfectly level with a plate of copper resembling in " form the front of a cap screwed to the square of it," and " by " means of a cramp and another piece of copper corresponding to " that attached to the block that part of the crown which in the " first instance slants to the centre of the tip is forced perpen-" dicularly into a groove in the block behind, the front forming " the concave to the convex of the front and leaving the tip of " the cap when finished perfectly level."

[Printed, 4d. Woodcut. See Repertory of Arts, vol. 24 (*second series*), p. 209; Rolls Chapel Reports, 8th Report, p. 96.]

A.D. 1813, July 14.—N° 3721.

FERGUSON, GEORGE, and ASHTON, JOSEPH. — " An im-" improved light elastic waterproof hat, commonly called a beaver " hat." The patentees make hats " perfectly waterproof and " elastic " by working into the bodies and brims a solution composed of (1) 8 oz. of gum amber dissolved in 10 oz. of essence of turpentine and 6 oz. of prepared linseed oil and 4 oz. of essential oil of lavender; (2) 4 oz. of resin dissolved in 12 oz. of boiled linseed oil and 4 oz. of essence of turpentine; and (3) 4 oz. of gum mastic, 4 oz. of sandarac, 4 oz. of gum anime, and 4 oz. of " gum elani," all dissolved in 30 oz. of rectified spirits of wine. The whole is to be well mixed together.

[Printed, 4d. No Drawings. See Repertory of Arts, vol. 31 (*second series*), p. 77; Rolls Chapel Reports, 8th Report, p. 99.]

A.D. 1815, June 17.—N° 3930.

SERVICE, Grace Elizabeth.—"A new method of manufac-"turing straw with gauze, nett, web, and other similar articles "for the purpose of making into hats, bonnets, workboxes, "workbags, toilet boxes, and other articles." Straw is interwoven into a piece of gauze, net, &c. of size and shape according to the article to be made. The straw is threaded through a needle of peculiar form (represented in a woodcut in the specification), but any other suitable instrument may be used; after the weaving the straw is sewed or otherwise secured to the gauze or net which "may be cut away so as to produce a diamond or other "pattern."

[Printed, 4*d*. Woodcut. See Repertory of Arts. vol. 28, (*second series*), p. 202; Rolls Chapel Reports, 8th Report, p. 106.]

A.D. 1816, March 23.—N° 4000. (* *)

PAULY, Samuel Jean.—"An article or substance for making "without seams coats, great coats, waistcoats, habits, cloaks, "pantaloons, mantles, stockings, socks, and any other kind of "clothing, covers for umbrellas and for hats, and mattresses, "seats, and cushions filled with atmospheric air." The substance is "the peritoneal coat, membrane, or covering of the coecum or "blind gut of animals;" it may be used immediately after it is taken from the animal, or it may be dried and when wanted be soaked in water until sufficiently soft and pliant to be stretched.

The skin is placed wet upon a model of the article required, and as many are used as are necessary to complete the size; they are joined together by laying the edges of one a little over the edges of another, and as they dry, "they become by their gluti-"nous nature united and consolidated;" a small quantity of glue dissolved in the water in which they are soaked will increase their adhesion. When the skins are perfectly dry and consolidated, the whole is varnished on both sides "with any varnish fit for "oil skin."

[Printed 4*d*. No Drawings. See Rolls Chapel Reports, 8th Report, p. 111.]

A.D. 1817, July 19.—N° 4145.

BRUNTON, Frederick.—"A new mode of employing silk or "*other materials in* the making of hats and bonnets." The silk or other substance, such as linen or cotton, is plaited or woven into braids, and it is preferred to use silk "in the gum" and to dye the hat or bonnet after it is made up.

The hat or bonnet may be made in different ways:—(1) it may be "sewed over and over like the common straw, but in this case "the silk must be dyed previous to making up;" (2) by sewing the braids "edge to edge, the stitches close and drawn quite "tight" and on the inside; (3) "by knitting the braids" as is done with Leghorn and other plaits. The crown may be "knitted "first and afterwards the brim," or "they may be knitted all in "one piece."

The stiffening may consist of isinglass or French starch or like substance; it must be "perfectly clean and of sufficient consis-"tence not to penetrate through the texture;" it had better be applied inside.

The hat or bonnet is blocked "whilst in a damp state and "either pressed with a hot iron or hot pressed like the Leghorns." Paper or linen should be kept between the iron and the hat or bonnet.

The crown may be kept in a proper shape "by applying paper "to the upper part in the inside."

[Printed, 4*d*. No Drawings. See Mechanics' Magazine, vol. 7, p. 47; Rolls Chapel Reports, 8th Report, p. 118.]

A.D. 1820, March 18.—N° 4439.

PRITCHARD, William, and FRANKS, Robert.—"Manu-"facturing waterproof hats." The waterproof composition used consists of 1 lb. of "gum kino," 8 oz. of "gum elenic," 3 lbs. of "gum olibanum," 3 lbs. of "gum copal," 1 lb. of "gum ladanum," 2 lbs. of "gum juniper," 1 lb. of "gum mastick," 10 lbs. of "resin shellac," 8 oz. of "common frankincense," 3 galls. of alcohol, 1 pint of "liquid ammonia," 1 oz. of "oil of lavender," and 1 lb. of "gum myrrh and gum opoponax previously dissolved "in 3 pints of proof spirits of wine." Bruise the gums as smal as possible and put them into a well-glazed earthen vessel; pour in the alcohol, and place the vessel in a water bath heated to 176° Faht. Keep up the heat for about 2 hours and then put in the ammonia, oil of lavender, and dissolved gums. Stir the whole well together, and when the mixture "appears free from "lumps" *it will be fit for use*."

The shell of the hat is made without "any nap underside." The underside is to be stiffened with the composition "according "to the substance required." When the shell is "sufficiently dry "to admit of handling," it is to be turned and put on a tight-fitting block, and the crown is to be stiffened "with as much of "the composition as the shell will take without its going "through." The shell is then to be dried in a warm room and afterwards to be steamed and flattened; if it is not "hard "enough" when cool, a "little thin glue and cherry gum" will "fill up the places missed" by the composition. The under side of the brim is to be stiffened with the composition, which when dry is to be well ironed into the brim "so that not any appears "on the surface." The "tip and side of paper" are to be put in when the shell "is cool and dry;" then air-holes are to be pierced through the side of the crown (from the inside), and the shell is to be finished off "in the usual way." Finally, the shell is to be coated with a thin paste of flour and water, and when this is dry with as much copal varnish as "will stick the silk or beaver."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 40 (*second series*), p. 138; London Journal (*Newton's*), vol. 1, p, 408.]

A.D. 1821, July 26.—N° 4574.

BARKER, THOMAS, and HARRIS, JOHN RAWLINSON.—"Improvements in the method of clearing furs and wools used in "the manufacture of hats from kemps and hairs." The improvements claimed are (1) an extended wind passage and regulator, (2) a divided wind passage, (3) a double regulator, (4) a reel instead of a fan, (5) a receiving chamber "situated above or over and "behind the extremity of the wind passage."

The patentees describe first a machine "such as is now in use" with the addition of part of their improvements:—"A slight "false bottom resting upon a beading" serves to extend the wind passage and to support "the cleared fur that settles in the receiving chamber." A sliding board (called a regulating board), having one end "elevated at an angle of about forty-five degrees," slides on beads backwards and forwards over part of the false bottom, thereby regulating the opening into the receiving chamber. The back of the chamber answers the purpose of a check-board. A small sliding board regulates the admission of air from the fan.

Secondly, a machine in which the receiving chamber is so placed that the end cannot serve as a check-board:—An upright check-board, "a little higher than the sliding board," stands at the inner end of the wind passage. The advantages arising from this arrangement are explained in the Specification.

Thirdly, a machine with all the improvements:—An upper regulator moves on a hinge and is upheld by a string, so that the opening into the receiving chamber may be regulated. An under regulator is "fixed in one position;" it has its own check-board, whilst "part of the end of the receiving chamber" serves as a check-board to the upper regulator. The increased length of the wind passage is obtained "by a back draught." The reel (which is substituted for a fan) is a hollow cylinder made with a flange at each end. Cords of catgut varying in number extend from flange to flange, and a pin striking them as they pass round causes " their rapid vibration." The cords "take the material to be " cleared from the feeding cloth, shake it open" and "cause " sufficient wind in their rotation to force it into the wind passage." Small fans may be added on the periphery of the cylinder. The action of this machine is described in the Specification.

[Printed, 10*d*. Drawings. See Repertory of Arts, vol. 42 (*second series*), p. 193; London Journal (*Newton's*), vol. 3, p. 119; Webster's Reports, vol. 1, p. 126; Webster's Patent Law, p. 49, also p. 131, case 76; Parliamentary Report, 1829 (*Patent law*), p. 208; Holroyd on Patents, p. 60; Carrington and Payne's Reports, vol. 1, p. 567; Billing on Patents, p. 62.]

A.D. 1822, October 18.—N° 4719.

LANE, URIAH, the younger.—" An improvement in the platting " of straw, and in manufacturing bonnets and other articles " therefrom." The patentee claims as his invention "every " variation of split straw plait which can be produced with single " straw, upon the principle of having one side made entirely of " the outside or bright side of the straw."

He describes a plait made with 13 single straws, not confining himself to that number. The straws are fastened together at " the white or clear end of the straw;" they are arranged side by side, "with the bright surfaces downwards," and parted, 7 on one hand and 6 on the other.

Hold the fan of straws in the left hand, " the back or dull side " being next you;" take the outside straw by the finger and thumb *of the right* hand; draw it towards you in a slanting direction; "shift the position of your thumb and finger, and "place your thumb on the bright side of the straw thus brought "down, by which means you will be enabled to twist the splint "of straw, and turn it round behind the other splint of the fan, "with the bright side from you." Interweave this splint with the others, "by passing it under the second and third splint, over "the fourth and fifth, and under the sixth and seventh," keeping the bright side "constantly turned from you." There will now be "seven straws on the left side, and you must proceed by taking "the outside splint between the finger and thumb of the left "hand, and drawing it towards you as before described." By changing the position of the finger and thumb, "you will now "be enabled to twist the straw, and turn its bright side from "you," and it is to be plaited under and over the others as before. Continue "to twist and plait in the outer splint from "that side on which seven splints have arranged themselves."

The patentee describes also the method whereby "a new splint "must be set in, and the end of the exhausted one set out."

The plait when bleached and stretched is made into bonnets by knitting it together, "after the manner of the Leghorn plait."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 46 (*second series*), p. 71; London Journal (*Newton's*), vol. 5, p. 11.]

A.D. 1823, May 27.—N° 4794.

OLLERENSHAW, EDWARD. — A method of dressing and finishing hats by "means of certain machinery and implements "to be used and applied thereto." The machinery consists of three parts, all worked by the same power. The part at one end is fitted up as a lathe. A hat block, composed of four outer pieces which fill the inside of the hat and are jammed tight therein by a square central piece, is secured to a chuck on the horizontal spindle. The block is kept together by thumb screws, which pass through the end of two of the pieces into a groove cut round the chuck. The workman, carrying a hot iron in one hand and a plush cushion in the other, dresses the crown during the revolutions of the block.

The middle part has an upright spindle, on whose top is a chuck with three pins projecting upwards. The workman transfers the block to this chuck, and dresses the top of the crown whilst the block revolves. He then removes the block, and puts on the *spindle another* chuck carrying an oval block, "adapted to fit

" into the hat, so that the brim thereof will lie upon the top " surface of the circular brim of the chuck." Here he smooths and finishes the upper side of the brim.

The part at the other end has also an upright axle, whose upper portion is divided into three branches; these support an iron ring, on which is fastened a wooden ring. A " divided ring" "is " adapted to fit into and upon" the wooden ring, and "to en- " compass the crown of the hat close to its brim." The hat being properly adjusted, the workman smooths the under side of the brim.

Each side of the brim requires a repetition of the foregoing process, and "to finish the hat completely;" all "burs and coarse " hairs" are removed, and the hat "is subjected a second time " to all the series of operations above described."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 46 (*second series*), p. 396; London Journal (*Newton's*), vol. 7, p, 132; Register of Arts and Sciences, vol. 1, p. 181; Engineers' and Mechanics' Encyclopædia, vol. 1, p. 670.]

A.D. 1823, November 18.—N° 4866.

GILLMAN, JOSEPH, and WILSON, JOHN HEWITSON.—" Im- " provements in the manufacture of hats and bonnets." The patentees cover the bodies of these articles, whether made of felt, cotton, wool, &c., with a woven material "made wholly of cotton, " or having a cotton basis and a silk outside." For manufacturing this covering, they use "carded and roved cotton in the " ordinary way for weft to weave on the face side of the covering " material when the same is to be made wholly of cotton," and for the other side they "spin cotton into fifty weft, and make the " warp of cotton twist."

When the material is woven, "the down is raised upon its face " with cards and teazles." The material may be dyed by any of the processes in use.

If the face of the material is to be of silk, they use properly prepared silk for the weft instead of cotton.

The specification contains a long description of the method of preparing the loom (a common one) for work.

[Printed, 4*d*. No Drawing. See London Journal (*Newton's*), vol. 8, p. 67.]

A.D. 1823, November 20.—N° 4868.

HOPPER, THOMAS.—" Improvements in the manufacture of " silk hats." "The woollen substance which forms the basis" is boiled in a solution of common alum for about 2 hours, the proportion being 2 or 3 lbs. of alum to 1 gallon of water; it is then well rinsed in clear water, wrung, and immediately dipped into a solution of isinglass or glue (" of variable strength ") at a boiling heat, after which it is put on a frame to dry and give it a shape. The cloth thus prepared is immersed into " a strong solution of " acetate or tartrate of alumine " before or when it is dry. The next process is to dip the cloth into a solution of " gelatin " and one of the aluminous salts added together;" it is then wrung, dipped once or twice into " an alkaline lixivium," and dried. " The resinous gums " may now be applied, either as " at present practised " or " in the humid way dissolved in a " spirituous menstruum with a portion of Venice turpentine."

" Between the resinous gums and the varnish an intervening " substance, not fusible by heat, is necessary, to prevent the " latter from subsiding; isinglass dissolved in weak spirits, gum " acacia, simple or pure aluminous paste, &c. suffice; the pure " alumine is also used inside, mixed with common or resinous " paste."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 1 (*third series*), p. 217; London Journal (*Newton's*), vol. 8, p. 5; Register of Arts and Sciences, vol. 4, p. 78.]

A.D. 1824, February 19.—N° 4900.

LLOYD, ROBERT, and ROWBOTHAM, JAMES.—" A hat upon " a new construction." The peculiarity of this hat (which may be made of any suitable material) is that " the crown is made " to rise and fall, and " in the latter case the folding or space " part is taken up, so as to be completely out of sight." The hat is cut out of two or more pieces of felted or woven cloth or fur; these are joined together, and then strained or blocked to the required shape. The rise and fall may be effected in either of the following ways; (1) by a " diamond jointed prop;" (2) by " a corkscrew joint;" (3) by a hoop and wires; (4), by a " tele" scope-sliding joint."

1. The prop is made like a lazy-tongs; one end is fastened to the top of the crown inside, the other at or near the band. The number of props and the number of joints in each prop vary according to circumstances.

2. This joint is " a piece of metal wire, bone, or wood, bent so " that the two ends meet," and between the ends is placed a

" roller of metal or hard substance with teeth, or indented." The teeth act as stops, "the whole acting upon the principle of a " corkscrew." To each end is fastened a wire, one to be attached to the inside of the crown at the top, the other near the band.

3. The hoop is "nearest the top of the crown and passing " thro' several eyes or loops ;" the wires or uprights are attached to the hoop and to the band. At each end of the uprights is "a " moving joint and swivel," so that each "will have two distinct " motions." When the crown is raised, "a small spring hasp " in the hoop" will keep it from falling down.

4. Two or more pieces "are made with sliding grooves," so that one "may be pulled out over the other ;" each fastens with a snap or equivalent.

"There are many other methods by which these hats may be " supported and worked up and down, and of which the patentees " mean to avail themselves."

[Printed, 4*d*. Woodcuts. See Repertory of Arts, vol. 10 (*third series*), p. 89; London Journal (*Newton's*), vol. 9, p. 76; Rolls Chapel Reports, 7th Report, p. 124; Register of Arts and Sciences, vol. 2, p. 199.]

A.D. 1824, March 20.—N° 4923.

PETITPIERRE, Jean Henry.—"An engine or machine for " making the following articles from one piece of leather without " any seam or sewing whatever, that is to say, all kinds of shoes " and slippers, gloves, hats and caps, cartouche boxes, scabbards " and sheaths for swords, bayonets, and knives." The principal parts of this machine are (1) a cast-iron bed supported on a bench or table and having parts of it "made as truly plane or flat as " may be ;" (2) an adjustable table jointed to ears at one end of the bed; (3) a "cast-iron stock" with on its under side "a cylin- " drical stud" which works in a groove in the bed, a rib "the " rounded edge of which glides or plays upon the plane or flat " surface of the bed," and "arms projecting sideways which also " glide or play upon the said flat surface ;" the three bearings all conduce to give (4) the cutters affixed to the stock "that move- " ment in a perfect plane or nearly so which is requisite to the " success of their operation ;" (5) an arm united to the stock by two screws "but not so firmly but that it will yield a little to the " action of an adjusting screw" which screws into the arm and presses on the stock; the outer end of the arm carries a handle whereby the cutters are actuated; (6) guards and guides "of different forms according to their required uses" affixed to the arm; (7) an adjusting screw for further support of the table; (8) a gauge under the table for adjusting its level.

In order to form a leather cap or hat, the leather must be cut into the shape shown in the sheet of drawings, and then be held down on the table "by the inner border" of a "guide plate;" it is then "to be slit internally as far as is shown by the inner dotted "lines" by means of a cutter and guard, and, finally, to be "blocked and worked into shape in the usual manner of hat or "cap making."

[Printed, 8*d*. Drawing. See Repertory of Arts, vol. 1 (*third series*), p. 64; London Journal (*Newton's*), vol. 9, p. 344; Rolls Chapel Reports, 7th Report, p. 124.]

A.D. 1824, June 15.—N° 4976.

GIBSON, John.—"Manufacturing or making of an elastic fabric "from whalebone, and of manufacturing or making of elastic "fabrics from whalebone, hemp, and other materials combined, "suitable for making into elastic frames or bodies for hats, caps, "and bonnets, and for other purposes; and also of manufacturing "or making of such elastic frames or bodies from the same materials or by the mode of plaiting." The whalebone is cut "into "threads about the thickness of a hay straw," then boiled for an hour in a solution of alum "or any of the alkaline substances" in the proportion of about 1 lb. to 1 gallon of water, then rinsed in clear water, and afterwards hung up till dry. It is then separated into lengths, the longer ones for the warp, the shorter ones for the weft, and previous to the weaving the lengths for the weft should be softened by steeping in water for about 12 hours. A "hair cloth loom" is preferred, and the arrangement of it is described in the specification. After the weaving the fabric is pressed, "which process makes it smooth and increases its elasticity." If the fabric is to be exposed "to much perspiration "or damp," it should be dipped after the pressing into (or be coated with) a suitable varnish.

The whalebone threads may be combined with hemp, hair, willow, cane, cotton, wool, silk, or other substances, in proportions varying according to the purpose for which the fabric is intended.

Elastic frames or bodies of hats, &c. are made by steeping the whalebone threads in water for about 12 hours and then plaiting them on a block "by any of the modes of plaiting commonly "practised;" or by cutting out of a piece of plaiting the different parts required, sewing them together, and binding the edges with cloth. If less elasticity is wanted, any of the before-mentioned substances may be combined with the whalebone threads.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 10, p. 85; Register of Arts and Sciences, vol. 3, p. 22.]

A.D. 1824, October 14.—N° 5018.

WEISE, William Philip.—"Improvements in the preparing "of and making waterproof cloth and other materials for the "manufacturing hats, bonnets, and caps, and wearing apparel, "and in manufacturing the same therefrom." This cloth is to be used principally for the outer covering of hats "by being fixed "on wool bodies or other frames in the usual way of making silk "hats."

For fine hats the materials consist of beaver, fine wools, flax, down, and carded silk; for inferior hats coarser wools and mohair are used. The proportions are beaver 5 lbs.; "musk wool, "neuter wool, and backs of hares wool," each 5 lbs.; flax or hemp 2 lbs.; down or feathers 1 lb.; Saxon wool 1½ lb.; carded silk ¾ lb. For inferior hats the wools mentioned are "coney wool, "seal wool, camel hair, red wool, camelia wool, Spanish wool, "squirrel wool, English wool." The materials are to be divided into 142 parts, so that "about two ounces and a half may pass at "a time through a fine carding engine." Care must be taken that the beaver and the fine wools be laid on the roller cloth first so that they "may be kept by themselves on the top." The materials are spun into threads "of two sizes, one much finer than "the other," and "reeled into skeins for shoot."

If the cloth is to be waterproof, the finer skeins are to be saturated with a composition of equal parts of shellac, india-rubber, gum mastic, gum animé, and gum sandarac, dissolved in spirits of wine or other spirit to the consistence of water. When the skeins are dry, both fine and coarse are to be dyed, and afterwards woven into a fabric, "the fine or waterproof skein "to be used for the back or last shoot, and the coarse one for the "face of the cloth."

The cloth is to be passed through a hot cylinder or to be ironed on the back with hot irons, " by which the mixture on the fine " shoot and the warp will run through the whole center of the " cloth, uniting the shoots and back of the warp together and " thus completing the waterproof process." The finishing processes are stretching on a frame and carding up the face side with fine cards or teazles.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 1 (*third series*), p. 468; London Journal (*Newton's*), vol. 11, p. 21.]

A.D. 1825, August 27.—N° 5248.

BOWLER, John, and GALON, Thomas.—" Improvements in " the construction or manufacture of hats." The improvements consist (1) " in making double the brims of hats," (2) in making double " the entire body of hats that are intended to resist much " exposure to weather."

1. The body of a hat " in its first state, when planked, that is " to say, in the conical form " is turned inside out, and a cylindrical piece of felt of the same material as the body, manufactured in the same way, planked, and about half an inch deeper than the intended brim, is fastened (the patentees prefer by close stitching) to the base of the cone. The body with its second brim fastened to it is " stumped " in the " making kettle " to take out " any " wrinkles in the brim," and is then ready for subsequent manufacturing. The leather " must be stitched on through the inner " or lower only of the two pieces of felt forming the double " brim."

2. Two conical hat bodies are " planked one within the other," and are then stitched together to the extent of what would be the double brim, or it may be all over. They are then treated as one body except that the stiffening mixture " is to be applied to the " outside of the crown of the double body as well as the inside, " but very lightly as to the outside of the crown so as not to " prevent the hat from ruffing well afterwards." The patentees describe a modification of their method of making double-bodied hats.

The foregoing applies to beaver hats. Silk hats after being stiffened are to be " blocked and dried and then steamed and " tipped, and next prepared and covered with silk shag (except " within the crown) instead of being ruffed."

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 13, p. 264.]

A.D. 1825, November 17.—N° 5295.

BORRADAILE, George.—(*A communication.*)—"An improved "method of making or setting up of hats or hat bodies." For this invention a machine of the following construction is required:—Two cones "rounded towards the apex" are placed base to base so as to form a double cone; they bear upon other cones which turn on pivots, "their axles being placed in oblique positions and inclining considerably from the horizontal." The two front bearing cones "have beveled toothed rims affixed to their bases;" these gear into each other at the point where they meet, and are made to revolve by a beveled pinion which takes into the teeth of one rim. The double cone and the rear bearing cones are caused to revolve "by the friction of the surfaces in contact."

If a sliver of wool from a carding machine (placed behind the machine) is put on the upper side of the double cone and the cones are made to revolve, it will be wound round the double cone in a uniform layer.

"To obtain a crossing or diagonal layer of the sliver" the machine is made to turn round horizontally upon a foot pivot in front and upon a swivel joint at top, to which the back part of the machine is suspended by a bent rod. "The regular vibratory "motion of the machine is effected by an adjustable lever or "bar;" this is attached at one end to a brace and at the other to a crank wheel. The gear required for the machine is described in the specification.

"A matted or laid substance" is produced; it is to be cut round the middle of the double cone, and when slidden off forms two conical bags "which are afterwards to be wetted and shrunk "and felted together," ready to be used as hat bodies.

[Printed, 8*d.* Drawing. See Repertory of Arts, vol. 4 (*third series*), p. 7; London Journal (*Newton's*), vol. 11, p. 353; Register of Arts and Sciences, vol. 1 (*new series*), p. 180; Engineers' and Mechanics' Encyclopædia, vol. 1, p. 669; Ure's Philosophy of Manufactures, p. 190.]

A.D. 1826, February 7.—N° 5328.

MAYHEW, William, and WHITE, William.—"An im"provement in the manufacture of hats." This invention relates to silk hats, although part of it "will apply to beaver as well "as silk hat bodies." The body of the hat is made "with "wool or stuff," and "the under part of the brim" is covered

" with beaver or fur instead of silk." The body is dyed black, and "the silk will be placed on the crown and the upper part " of the brim, and the hat will altogether resemble a beaver hat " more than any ever yet made, the body and under part of " the brim being of the same construction and united in one " body."

"An extra quantity of stuff" is added "to that part called the " brim of the hat by bowing an extra piece in the way of stop " wool and felting it together over a hat bason." To prevent the edge of the hat wearing out so soon "a soft substance" is placed " on the edge of the tip underneath the silk;" moreover "the " shag for that part of the hat" is made "with a silk ground or " back instead of cotton."

[Printed, 4*d*. No Drawing. See Repertory of Arts, vol. 5 (*third series*), p. 65; London Journal (*Newton's*), vol. 12, p. 308; Register of Arts and Sciences, vol. 4, p. 341; Rolls Chapel Reports, 7th Report, p. 126.]

A.D. 1826, February 18.—N° 5335. (* *)

WALLER, THOMAS.—"Certain improvements in the manufac- " turing of straw plat for the purpose of making bonnets, hats, " or other articles."

This invention consists "in the employment of the ordinary " wheat straw grown in Tuscany and other part of Italy," which the patentee plaits, twists, or weaves in the same manner as English straw, except that he uses "the upper part nearest the " ear of the straw, instead of the lower part, or that which is " contained in the hull, in order to produce similar kinds of " straw fabric to those made of English straw."

The patentee excludes from his claim under this patent "the " English imitation of Leghorn plat."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 9 (*third series*), p. 83; London Journal (*Newton's*), vol. 12, p. 66.]

A.D. 1826, February 18.—N° 5337. (* *)

BUFFUM, ARNOLD.—(*Partly a communication.*)—" Improve- " ments in the process of making or manufacturing and dyeing " hats." These improvements consist in the "constructing, " applying, and using, in the process of dyeing hats, a wheel " fitted with pins, bolts, screws, or hooks, on one or both of its " sides, to hang hats upon, and in placing or suspending the

" said wheel partly in and partly above the dye pan, in a perpendicular position, in such manner that when one or both of " its sides are covered or partly covered with hats, and a gentle " revolving motion given to the wheel, the hats are alternately " changed from the dye liquor to the air ;" or, " instead of the " above-mentioned wheel, although for the same purpose, a rack, " fitted with pins, bolts, screws, or hooks, on one or both of its " sides, to hang hats upon; and in suspending the same in a " perpendicular position in and over the dye pan, by any of the " means used for raising and lowering heavy bodies, in such " manner that when its sides are covered or partly covered with " hats, it may be alternately lowered into the dye liquor and " raised again into the air, where the hats will, without handling, " be exposed to the action of oxygen, in the same manner as when " on the wheel."

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 14, p. 15; Register of Arts and Sciences, vol. 1 (*new series*), p. 212.]

A.D. 1826, April 18.—N° 5347.

ROWBOTHAM, James, and LLOYD, Robert.—" Method of " preparing, forming, uniting, combining, or putting together a " certain material, substance, or thing, or certain materials, " substances, or things, for the purpose of being made into hats, " caps, bonnets, cloaks, coats, trowsers, and for wearing apparel " in general, and various other purposes." The material is cork, either cut into slices " as nearly of an equal thickness as " may be, however their widths may vary," or woven into a fabric with a warp of hemp, silk, cotton, or other fibrous substance. The cork for weaving is cut into strips " varying from " one inch or less to twenty or more inches long, and from one " sixteenth of an inch or less to one quarter of an inch or more " in thickness, and from one sixteenth of an inch or less to one " quarter of an inch or more in width."

Hats, caps, and bonnets are made from cork prepared in either way. The directions given for making a hat are, steam and block a felted hat to the required shape. Take it off the block; cut it open; " subdivide it into such portions or parts as may be required to form true and convenient patterns by which the " sheets of prepared cork or woven cork are to be cut." Place the cut pieces of cork round the block; sew, glue, or cement them together, " by which means the crown, body, brim, or tip " are completed."

These articles may be made of strips of cork plaited " after the " manner of straw hats."

Strips of cork are used instead of pasteboard or paper to prevent the crowns " from sinking or rising."

Wearing apparel is made from the woven fabric, " either wholly " or in part covering one or both sides with wool, cotton, linen, " silk, hair, fur, or any other proper material."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 8 (*third series*), p. 660; London Journal (*Newton's*), vol. 13, p. 183.]

A.D. 1826, July 14.—N° 5387.

GUY, John, and HARRISON, Jacob.—" An improved method " of preparing straw or grass to be used in the manufacture of " hats and bonnets." 1. Preparation of straw:—Cut the straw off close by the roots, or rather pluck it up by the roots, " after " the corn is in the ear, but whilst it is still in a greenish state." Tie it together " near the roots " in bundles of about 150 straws; spread out each bundle " so tied up like a fan " in a field which " is laid down in grass," and expose them to the air for two or three days and nights, taking care to turn each bundle once or twice every day. The bundles may however be exposed to the air in any dry place upon hooks or cords with equal benefit. Tie the bundles into larger bundles, each containing about 30 of the smaller; keep them in sheds during the nights, and untie them and expose them to the air and the rays of the sun each day, " until all the vegetable juices within the straw are perfectly and " completely dried." The straw is " then to be considered as " cured, whether the greenish hue remain or not." Continue the exposure to the air and sun by day, and the storing up at night " till all appearance of green be totally and completely gone " and till the straw assumes a bright yellow or golden hue;" it is then fit for use.

If preferred, the straw may be plaited in a greenish state, and be afterwards exposed, &c. until it acquires the golden hue.

2. Grass is prepared in a precisely similar manner, care being taken to cut or " pull it up by the roots after the ear has sprung " forth, but before it is quite ripe."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 4 (*third series*), *p.* 431; London Journal (*Newton's*), vol. 1 (*second series*), p. 150.]

A.D. 1826, September 19.—N° 5412.

WILLIAMS, Thomas Robinson.—"An improved method of "manufacturing hats and caps with the assistance of machinery." This machinery is attached to a carding engine "for the purpose "of winding the slivers of wool or other materials taken from "the doffer cylinder" on to blocks "suited to the forms of the "intended hats or caps."

The doffer cylinder "is covered with fillets of cards divided "into two, three, or more spaces extending round its periphery," the object being to separate the sliver into breadths which are to be wound upon distinct blocks. "The principal cylinder" and "the subordinate rollers" are all turned "as in the ordinary "construction," and the wool is supplied to the feeding cloth and carried to the doffer cylinder "as in other carding engines." The slivers are taken from the cylinder by the doffer comb, and are received on the surfaces of the blocks (there are three in the machine described), which are mounted upon axles in a carriage, and revolve by means of a band "leading from a pulley on the "axle of a conical drum." In order to cross the slivers in different directions and to pass them "over the hemispherical ends "of the blocks," the carriage "is made to traverse to and fro in "lateral directions upon rollers." The method of obtaining this alternating motion is explained in the specification.

To wind the slivers with uniform tension it is necessary to vary the speed of the blocks; "this is effected by giving different "velocities to the pulley on the axle of the conical drum." For this purpose "a similar conical drum" is placed "in a reverse "position," and actuated by a band which passes over a pulley on its axle, and a band "is made to slide along the drums by the "guidance of two rollers" at the end of a horizontal lever which helps the alternating motion of the carriage.

"Heavy conical rollers" bear upon the peripheries of the blocks and press the slivers on them.

After the bodies are formed they are folded in wet cloths and placed on heated plates where they are rolled under pressure. The plates are heated over furnaces; the pressure is effected by "flaps and covers" which slide on guide rods and receive "a "traversing motion" by means of chains attached to an alternating bar. The bodies are afterwards felted either by hand or in a fulling mill; in the latter case they are occasionally taken out and passed between rollers "for the purpose of rendering the "felt more perfect."

[Printed, 10*d*. Drawing. See London Journal (*Newton's*), vol. 14, p. 65; Ure's Philosophy of Manufactures, p. 191.]

A.D. 1827, July 4.—N° 5515.

WILSON, William.—"The means or principle of extracting "spirits and other solvents used in dissolving or rendering "malleable gums of various kinds and other articles employed "for stiffening hats, hat bodies, bonnets, caps, and divers articles "of merchandizes, and converting such spirits (after rectification) into use." The apparatus required for carrying out this invention consists of a boiler, a steaming box, and a tub with a worm in it. The boiler, set in brickwork, is fitted at the top with a plate in which are fixed two stop-cocks; from one side project two stop-cocks, one about three inches from the top, "to "which the boiler should be filled with water," the other at or near the bottom. One of the cocks fixed in the plate communicates by means of a pipe with the steaming box, the other serves as a safety valve. The steaming box stands on a frame; it is furnished with a door and a pipe whose outer end is fitted to the worm.

"Hats or hat bodies, ready stiffened, sufficient to fill the box," each on a separate block or frame "made in the form of a cross, "with a peg in the centre in order that the hats may be kept "distended," are stuck by means of the pegs in framework lying at the bottom of the box. Steam from the boiler in from 10 to 12 minutes will extract "the spirit and other solvent used in the "dissolving the gums with which the hats and hat bodies have "been stiffened," leaving the gums in them.

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 8 (*third series*), p. 72; London Journal (*Newton's*), vol. 3 (*second series*), p. 94; Register of Arts and Sciences, vol. 3 (*new series*), p. 150.]

A.D. 1828, January 15.—N° 5604.

BLADES, Joseph.—(*A communication.*)—"An improvement in "the waterproof stiffening for hats." The object of this invention is "to produce hats without the use of spirits or essential "oils."

Two mixtures are required; the first consists of 18 lbs. of "gum "shell lac," 1½ lbs. of "salts of tartar," and 5½ gallons of water. The ingredients are to be boiled gradually for about an hour, "reserving part of the water to put in when likely to boil over," and "stirring the whole towards the last." When cold, "a thin "crust on the surface of a whitish cast mixed with the dirt of the "gum" must be taken off.

The second is made by putting about "half a pint of vitriolic "acid" into 5 gallons of cold water.

Directions:—Dip the hat body into the first mixture in a cold state; "draw the hat body off on a plank with a stamper, using "a light or heavy hand according to the stiffness required." Let the body remain until dry or nearly so; brush it with a hard brush, and then soak it in the second mixture for about 5 minutes, when the gum will be set. If the bodies are not to be napped immediately, "they may be thrown into a reservoir of pure water" until wanted.

"If the bodies have been made in vitriol," soak them in hot water and dry them before you attempt to stiffen them. Do not let water drop on the stiffened bodies "before they have been in "the acid water."

Any alkali which "will act as a solvent to the gum," and any acid "that will set such gum or neutralize the alkali," may be used instead of the above-named.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 7 (*third series*), p. 142; London Journal (*Newton's*), vol. 2 (*second series*), p. 95; Mechanics' Magazine, vol. 10, p. 238.]

A.D. 1828, March 25.—N° 5630.

LOWREY, Jane Bentley.—"Improvements in the manufac"ture of hats and bonnets." The invention "consists in the in"troduction of ribbon, silk, wool, cotton, or chip into plat for the "manufacture of hats and bonnets." The plat must be made "with a bar across" to admit and retain the material, which "must be drawn through the plat with a needle or other instru"ment taking up every alternate bar or every two or three bars." The material may be drawn through "either on one side or on "both sides." Plat made "with a long bar across" is the most suitable. When the material has been introduced, "the plat "must be sewn together in the usual manner."

[*Printed*, 4*d*. *No Drawings*. See Repertory of Arts, vol. 7 (third series), *p. 327*; *London Journal* (*Newton's*), vol. 4 (second series), p. 142.]

A.D. 1828, July 3.—N° 5669. (* *)

BARING, JOHN.—(*A communication.*)—" A new and improved " mode of making or manufacturing machines for cutting fur " from skins for the use of hatters, to be called cant twist blades " fur cutter." This invention consists in an improved mode of making the rotary blade in fur cutting machines, and improvements in the motions and gearings connected with it. The rotary knife or " cant twist cutters " are made as follows:—Two steel " blades are rivetted on two squares of a four-sided bar of iron, " one blade on each square," and then the whole is heated and twisted together so that the blades form spiral knives. This " cant twist cutter," is placed in the machine behind the ordinary standing or ledger blade " with its centre of motion level with the " edge of the ledger blade; by this means the revolving or cant " twist blades are so elevated above the standing or ledger blade " that in the revolution they have an oblique inclination or cant " upon the standing blade, which gives them a back bevel to the " edges of the cant twist blades which gives them sharper and " better cutting edges; this elevation or cant of the twist blades " puts them in such a position towards the ledger blades that the " shears do not choke in cutting very thick skins." On the shaft of the cant twist cutter are loose pulleys for giving motion to the feeding rollers by means of cog wheels gearing together. These loose pulleys are driven by bands passed round small fast pulleys fixed on the axle of the main motion shaft. One band should be crossed so as to give reverse motions to the feeding rollers. The main motion shaft is formed with two cranks from each of which a sweep rod is suspended, and connected by joints to a treadle. The main motion shaft is thus driven by the foot of the workman, and the dead points of action overcome by fly wheels affixed to the main axle.

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 3 (*second series*), p. 34; Rolls Chapel Reports, 7th Report, p. 127.]

A.D. 1828, July 17.—N° 5675.

RIDER, BENJAMIN.—" Improvements in the manufacture of " hat tips." These tips are made " of a new material or sub- " stance composed of some of the articles from which brown " paper is commonly made, combined with cork in a pulverized or " *granulated state.*"

Pulp or felted fibrous vegetable matters of which brown paper " or whitey-brown paper is commonly made," about 75.lbs. and " in a dry state," is worked in a mill or vat, "as paper makers " usually do," and pulverized or granulated cork (about 35 lbs.) is then so thoroughly mixed with it in the mill or vat as " to form " one compound substance." The compound is then moulded in the same manner as sheets of brown paper or mill-board and is fit " to be cut into circular pieces for the tips of hats."

The material may be rendered waterproof by coating one or both surfaces with varnish such as hat makers use for stiffening the shells of hats.

"The entire body of the hat" may be made of the material " either by moulding it from the vat to the proper shape or by " cutting the sheets and joining their edges together with cement."

The material may be applied to the manufacture of hat boxes, muff boxes, &c., and " the ravages of moths " may be prevented by adding in the vat a small quantity of pulverized cedar wood.

[Printed, *4d.* No Drawings. See Repertory of Arts, vol. 8 (*third series*), p. 734; London Journal (*Newton's*), vol. 3 (*second series*), p. 40; Rolls Chapel Reports, 7th Report, p. 127.]

A.D. 1828, September 11.—N° 5699.

WILLIAMS, Thomas Robinson.—" Improvements in the " making of hats, bonnets, and caps, and in the covering them with " silk and other materials with the assistance of machinery." The machine employed is for the purpose of " planking " the bodies of hats, &c.; it consists principally of a feeding board, a cistern containing a liquid (described below) and a roller, and a series of upper and of lower rollers. The series are placed horizontally and parallel to each other, and the upper series revolve in a direction opposite to the lower one. The axles of each pair " are in per- " pendicular slits in standards," and " the rollers are made to " press towards each other, either upwards or downwards, by weights or springs " applied near to the ends of the axles." Each pair is connected by toothed wheels, and at the end of the axles of each lower roller is a bevel wheel. All the bevel wheels are driven by mitre wheels mounted on lateral shafts, and the shafts are driven by larger mitre wheels " on the main rotatory axle."

The liquid (which is kept heated by a steam pipe) is composed *of a small proportion* of sulphuric acid and water " with dregs of

" beer or any other liquor generally used in planking hat " bodies."

The workman places the hat bodies (previously hardened) on the feeding board; they slide down into the cistern, and coming into contact with the roller therein are conducted upwards and pass through each pair of rollers; on ariving at the end "their " course is turned upwards," and "falling over on the surface" of the upper rollers they "are brought back again to the hands " of the workman."

The bodies when sufficiently planked are blocked into shape, and the external coating of woven silk or other material is attached "by an adhesive composition made of caoutchouc dissolved " in the usual way with a small proportion of resin and linseed " oil."

[Printed, 10*d.* Drawing. See London Journal (*Newton's*), vol. 3 (*second series*), p. 31; Rolls Chapel Reports, 7th Report, p. 128.]

A.D. 1828, December 10.—N° 5733.

MOORE, THOMAS WILLIAM CHANNING.—(*A communication.*) —"An improved method or combination of machinery for the " manufacturing hats or caps." The machinery called by the patentee a "forming machine" is connected to a carding engine, and the parts claimed as novel are (1) a cylindrical block with conical ends "rounded at their apexes," whereon two hat bodies can be made at one operation; (2) two rollers by which the block is supported and made to revolve; (3) the shaft and bevel gear by which one of the rollers is driven; (4) an adjustable crank and connecting rod by which the carriage bearing the block is moved to and fro in front of the carding engine.

1. The block (which should be as light as possible and hollow) is supported on two rollers which are mounted on a carriage, and the carriage runs on wheels on a railway which is fixed on a stationary frame at one end of the carding engine.

2. The axle of one roller is a plain rod "supported by end " plates or staples fixed to the ends of the carriage"; the other roller is hollow, and its axle is "a long cylindrical shaft" whose ends are mounted in standards fixed on the frame.

3. The shaft has a groove extending its whole length, and a " tooth or nib affixed to each end of the roller" acts in the groove and causes the roller to turn as the shaft revolves. In

the lower part of the frame is a horizontal shaft having a mitre wheel at each end; the one wheel works into a horizontal wheel which is its driver, the other into a mitre wheel at the bottom of a perpendicular shaft; at the upper end of this latter shaft is a mitre wheel which takes into a mitre wheel on the roller shaft.

4. The horizontal wheel in No. 3 has a perpendicular shaft supported in bearings and carrying at the top a crank adjustable in length by means of a slot, a sliding piece, and a nut. One end of a rod is jointed to the crank, and the other end is connected to the carriage "by another joint and a perpendicular bar."

When the block is sufficiently covered, "the matted material is to be cut round the middle of the cylinder and slipped off each end."

[Printed, 10*d*. Drawing. See London Journal (*Newton's*), vol. 3 (*second series*), p. 26; Rolls Chapel Reports, 7th Report, p. 128.]

A.D. 1829, February 5.—N° 5767.

DANINOS, ALEXANDER.—(*A communication.*)—"The manufacture of improved hats and bonnets in imitation of Leghorn straw hats and bonnets." The substance preferred for this manufacture is twilled cotton, but any other may be used which can be woven and be dyed, and "impressed in the way and manner" described below.

The substance when dyed is "dressed in the usual way, that is adopted in the manufacture of calicoes"; it is then "very carefully callendered" and rendered thereby fit to imbibe the following waterproof composition, viz., 1 oz. of good white hard curd soap dissolved in 1 pint of boiling water with the addition (when the heat is reduced to about 70° R.) of 1 pint of alcohol previously heated to 36° R. The fabric is next hung up in the air to dry "but without wringing," and when dry is immersed for about 15 minutes in a bath composed of 5 dwt. of muriate of lime, 1 pint of river water, and 1 pint of alcohol; it is then taken out (without wringing), rinsed in cold water, and dried in the air.

When twilled cotton of the ordinary thickness is used, two (and sometimes three) fabrics are cemented together. The cement consists of 4½ oz. of isinglass or similar substance dissolved in 1 pint of cold water, 4 oz. of starch dissolved in ½ pint of cold water, and 2¼ oz. of gum arabic dissolved in ½ pint of water; the *whole is to be well* mixed in as much water as will make up

3 pints, and the addition of 1 pint of alcohol "will make a sufficient quantity to cement the whole of the woven fabric for "12 bonnets or hats."

Each article being "constructed of 3 distinct pieces," each piece "is embossed or figured with an imitation of the plaiting "and sewing as seen upon the surface of the real Leghorn "hats and bonnets." The embossing, &c. is effected by means "of engraved plates, engraved rollers, and pressure; the process is fully described in the Specification.

The piece prepared for the sides "must have its two ends cut "perfectly straight," and a piece of silk or linen covered on one side with the cement is laid smoothly over the joint. The piece for the crown has "a small rim" turned up (by pressure into a groove in the embossing plate), and the sides are united to it by means of the cement and a band of silk or cotton. The brim is joined to the sides in like manner, "a rim being turned up "upon the brim, which enters the lower part of the sides, and to "which the sides are glued." The articles may be constructed of any number of pieces.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 7 (*second series*), p. 234; Register of Arts and Sciences, vol. 4 (*new series*), p. 34.]

A.D. 1830, August 5.—N° 5970.

HANCOCK, THOMAS.—"Improvements in the manufacture of "certain articles of dress or wearing apparel, fancy ornaments, "and figures, and in the method of rendering certain manufactures and substances in a degree or entirely impervious to "air and water, and of protecting certain manufactures and substances from being injured by air, water, or moisture." Hats, caps, overcoats, cloaks, gloves, leggings and gaiters, boots and shoes, (both upper and outer soles), and goloshes are made of a material which is composed of hair, wool, cotton, pulp of rags, or other suitable substance, liquid caoutchouc, and whiting, ochre, brick-dust, emery powder, and other like materials, "according "to the intended object."

The following proportions may be advantageously used:—10 lbs. of liquid caoutchouc, 10 oz. of whiting, 10 oz. of ochre, and 10 oz. of hair, wool, or other substance. The whiting and ochre should be first mixed with a small quantity of water; the hair, &c. should be generally cut very short; and the whole is to be thoroughly incorporated. A small quantity of glue, starch, or gum will increase the stiffness.

Sheets of the compound are made by spreading some of it on a flat surface; these when dry are rendered more compact by pressure.

The before-named articles are made from the sheets or by moulding (according to the article required). Colour and varnish can be added if required.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 7 (*conjoined series*), p. 295.]

A.D. 1830, November 4.—N° 6028.

BOWLER, John.—"Improvements in machinery employed in "the process of dyeing hats." By means of this machine "hats "are made to enter into the dyeing liquid in a different position "and in a different part of the dye kettle at each time of lowering "such machine into the dye kettle, whereby the hats will be more "evenly died."

The machine is "a square open framing," with four doors moving on hinges. Each door has "four cross framings," whereon are screwed plates carrying each three pins. A partition within the framework has five cross framings, on each side of which are screwed similar plates. The object of having three pins on each plate is to prevent the block fixed on them from turning round, or from "falling to pieces," hat blocks being "usually formed of "three parts." Tapped holes in the doors and partition allow of change of place of the cross framings.

The drawing represents a machine with eight sets of pins on each door, and twenty sets on each side of the partition. On each side of the machine there is a sort of handle rising above the machine, and the lowering into the dye kettle is effected by ropes and a pulley with a hook at its lower end.

The method of using the machine is described in the specification.

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 12 (*third series*), p. 129; London Journal (*Newton's*), vol. 8 (*second series*), p. 81; Mechanics' Magazine, vol. 15, p. 14; Register of Arts and Sciences, vol. 5 (*new series*), p. 271.]

A.D. 1832, July 19.—N° 6286.

HODGE, William.—"Improvements in apparatus for dyeing "hats." *This invention* professes to be an improvement on the machine for which Mr. John Bowler obtained Letters Patent bearing date Nov. 4th, 1830, No. 6028; it also consists in substituting "suspenders" for blocks.

1. The apparatus is generally of cylindrical shape, for convenience sake. There are several partitions in it, and every other one "is made to slide in a groove formed at top and bottom "across the machine." Friction rollers are fixed "in these "grooves, or on the frames of the partitions." The apparatus is hung by its axes on a frame, "which is raised or lowered by "means of a crane or by blocks and tackle;" it can be turned round and upside down on the axes.

2. The suspenders are secured to upright bars on the partitions by means of screw heads, which pass through mortises in the bars and are fastened by pins. Each suspender consists of "two bent "plates of copper, which form the cylinder for receiving the body "of the hats," and "the tops of the two halves" "form the "circular top for the crown." Arms, projecting from the suspender and formed at one end into eyes, are hinged to the bar. The whole is kept in position by a screw and nut, the screw head being turned by a suitably shaped winch. Within each half of the suspender is one portion of a stretcher pinned to it and to the nut, but "the expanding of the two parts of the block may "be obtained by other contrivances."

"The manner of using the machine" is explained in the specification.

[Printed, 10*d*. Drawings. See Repertory of Arts, vol. 15 (*third series*), p. 80; London Journal (*Newton's*), vol. 10 (*conjoined series*), p. 27.]

A.D. 1834, October 22.—N° 6705.

CAREY, George Daniel.—"Machinery or apparatus to be "employed in the manufacture of hats." The apparatus is applicable to the "operation of ruffing or plaiting, or fixing the fur "upon the bodies of hats by friction, pressure, and contortious "action." A furnace with a descending flue is set upon a brick or other suitable base, and over the furnace is placed a pan of lead "intended to contain a sour liquor, as a solution of vitriolic "acid and water." On the edge of the pan is erected a wooden casing enclosed on three sides, two of which carry an upper and a lower series "of what may be termed lanthorn rollers." The rollers revolve by means of bevel pinions which are turned by bevel wheels on lateral shafts.

The hat bodies with the usual coatings of beaver or other fur laid on their surfaces are placed "between hair cloths," and these are "folded within a canvas or other suitable wrapper." Three or more bodies being enclosed in each wrapper, "the packages are " severally put into bags or pockets in an endless band," and the whole is submitted to the action of the upper series of rollers, an operation which attaches or sticks the furs to the felts. The bodies, being taken out "for the purpose of examining them and " changing their folds," are packed "in a similar way in flannel " or other suitable cloths" and are again put into the pockets of the endless band, which is now stretched over the lower series " and round a carrier roller." The bodies are now "carried " along through the apparatus and submitted to the scalding " solution in the pan and also to the pressure and to a tortuous " action between the ribs of the lanthorn rollers as they revolve, " which will cause the ends of the fur to work into the felted " bodies."

[Printed, 6*d*. Drawing. See London Journal (*Newton's*), vol. 6 (*conjoined series*), p. 77; Rolls Chapel Reports, 7th Report, p. 156.]

A.D. 1835, December 7.—N° 6946.

SIEVIER, Robert William.—" An improved waterproof cloth " or fabric, made either elastic or non-elastic, applicable to various " useful purposes, and for an improved manufacture of water- " proof hats or caps." The patentee makes his hats and caps " with a nap or pile on the exterior surface." He dissolves india-rubber in spirit of turpentine and mixes therewith "a large pro- " portion of acetate of lead, litharge, sulphate of zinc, gum " mastic, or other fit and proper drying material." With this composition he coats the surface of a hat body, and on the coating he spreads "wool, cotton, silk, hair, or other fit and proper matter " or material cut into proper lengths." The whole is pressed so as to fix the material firmly to the surface. The hat is then dried and brushed so as to remove all superfluous particles of wool, &c.

He also prepares an elastic waterproof fabric "by uniting " leather and india-rubber" applicable for boots, shoes, belts, &c. He stretches sheets of india-rubber, coats one side with the composition before-mentioned, and presses on the coated side a piece of thin or pared leather of the same dimensions as the stretched sheet. In about 5 or 6 days the two will be "perfectly dry and

" united." By the application of heat (about 180° Faht.) " the " india-rubber will partially collapse and cause the leather to " have a corrugated surface." Cloth or similar fabric may be " used instead of leather."

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 12 (*conjoined series*), p. 210; Rolls Chapel Reports, 7th Report, p. 168.]

A.D. 1836, March 29.—N° 7050.

HOGAN, Thomas Cockerell.—" Improvements on hats, caps, " and bonnets." The patentee claims (1) the construction of " an elastic hat, cap, or bonnet, capable of yielding to accidental " external pressure and of recovering its original form on the " pressure being removed." The hat, &c. is composed of " a " supporting and distending body," called by the patentee " the " inner hat," and a covering of silk, cotton, beaver, &c. which he calls " the outer hat." The former is made of horsehair either alone or mixed with " hair-like filaments " of whalebone and threads of wool, silk, cotton, flax, &c. and sometimes with filaments " of " willow or other tough and flexible woods ; " it is cemented to the outer covering with a solution of caoutchouc or other elastic cement.

(2). He claims the weaving, " platting, or braiding of horse " hair or filaments of other herein-before mentioned substances, " singly or combined, upon a block of the requisite figure," for the inner hat.

(3). He claims the " forming an entire hat, cap, or bonnet of " horsehair alone or of horsehair intermixed with threads of silk, " wool, flax, or cotton, by weaving, platting, or braiding the same " upon a block."

He describes at length " one mode of proceeding in making up " a hat of the ordinary appearance worn by men," and the process by which he carries out his second and third claims.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 7 (*new series*), p. 155; London Journal (*Newton's*), vol. 10 (*conjoined series*), p. 303.]

A.D. 1836, October 13.—N° 7205.

SCOTT, Henry, junior, and OLIVER, Robert Stephen.—(*A communication.*)—" Improvements in the manufacture of hats, " caps, and bonnets." A contracting and expanding frame is attached to the inside of the hat in such manner as " to permit the " crown or upper part of the hat to be compressed or folded

" towards the brim and of being again expanded to the original " hat shape."

The frame consists of three rings and four or more uprights. The top ring is fastened " to the crown or tip of the hat by means " of an internal tip or crown;" the bottom ring is secured " to " the lower part of the hat body or brim;" and the middle ring, " having slight curvatures in it corresponding with the uprights," is sewed into the lining. The uprights are hinged to the top and bottom rings; they have also joints in the middle. The middle ring forms " a moveable crown by means of which the hat is " retained in the proper shape or compressed."

The hat may be made of any material of a flexible nature, the part between the crown and the brim " being always left in a soft " or unstiffened state."

Caps and bonnets " can be easily constructed according to the " invention to suit every case that can be required."

[Printed, 8*d.* Drawing. See Repertory of Arts, vol. 7, (*new series*), p. 316.]

A.D. 1836, October 28.—N° 7214.

CROOK, **Jeremiah.**—(*A communication.*)—" Improvements in " the machinery for manufacturing hat bodies."

[No Specification enrolled.]

A.D. 1836, November 15.—N° 7222.

WELLS, **Henry Augustus.**—" Improvements in the manufac- " ture of hats."

[No Specification enrolled.]

A.D. 1837, June 30.—N° 7397.

WELLS, **Henry Augustus.**—" Improvements in the manu- " facture of hats." The patentee claims the invention of, 1. " A blowing machine used for the purpose of clearing the " fur:"—A cased frame is divided into three or more compartments; each contains a cylindrical blower, two rollers of the same length as the blower and carrying an endless feed apron, two " delivering rollers " of the same length as the others, a wire grating in a slanting position and " having a slight reci- " procating motion imparted to it," and two boxes to receive the particles containing hair, dags, and dirt. At the top of each compartment is a chamber "covered with fine wire woven sufficiently close to allow the air to escape without the fur."

2. A machine "for forming the fur into a fine web:"—One portion is "a common carding machine having one main cylinder," but "the cylinders are smaller;" a circular covering is placed "over the fancy;" and there is added "a second fancy cylinder." The fur on coming from the second "card fancy" passes over "a projecting board" into the "next department;" here are (1) three rollers having round them an endless fine woven wire "through which air can pass, but not the fur;" (2) a fan "formed of a flat circular board" and having affixed to it four fans of sheet iron or other thin metal; (3) two pressure rollers bearing against two of the three rollers and receiving lateral motion from suitably arranged levers. The fur descends from the wire apron on to a board and is there "laid in successive folds by the motion which the board receives" from a crank. The whole of this machine is surrounded by a wooden case.

3. A machine for forming the web into a hat body:—Two pieces of horizontal framework have on their top surfaces each a rib of iron to form a railway for the carriage which bears a double cone of tin or other light material and covered with a cloth. A shaft supports and passes through the cone, giving it rotatory motion. Two uprights resting on the axles of the carriage wheels support the bearings of two rollers which feed the web on to the cone. On the under side of the bottom of the carriage is a piece of wood wherein is fixed a pin connected to a crank which "works under the carriage and produces a transverse or alternating motion of the carriage." A small box under the cone receives any fur that may fall, and "directly underneath" the cone are "pipes having minute apertures for the purpose of admitting steam to the web" in its progress towards the cone and when on the cone. In the middle of the cone is a groove "for the convenience of dividing the hat bodies when formed."

4. A machine "for hardening or basoning:"—Each hat body is placed between two perforated metallic cones, and the whole is put upon a hardening cone belonging to this machine. This cone is made of wood or metal; it has "coarser perforations" than the others, and its axle is a steam pipe provided with a stuffing box. *Another hardening* cone rests against the first-mentioned one;

its axle is provided with a handle for moving it to and from the other cone, and at the bottom with a bevel wheel which gears into other wheels in such manner that it gives its cone "an alternating rotatory motion," thereby causing the other cone (carrying the perforated metallic cones and hat body) to revolve "two or three times in each direction."

5. A "planking machine:"—This consists principally of (1) a frame or stand carrying (2) a trough "containing water slightly "impregnated with sulphuric acid and kept boiling by a coiled "steam pipe;" (3) an upper and a lower series of rollers "formed "of a composition of zinc and lead or other suitable metallic "substance" and properly geared; (4) a large roller "geared "into the end rollers" for the purpose of "turning the hat "bodies over and giving them direction backwards on the top of "the machine;" (5) weighted levers "suspended to each upper "roller;" (6) an inclined board for giving the hat bodies a direction towards the rollers. "The bottom rollers and a portion of "the top rollers" are kept immersed in the boiling acid mixture.

6. A machine for stiffening or proofing:—A vessel made with two compartments contains a solution of shellac or an equivalent in each; the solutions are of different strengths. Above the vessel two rollers gearing at their extremities are mounted in standards, one of which is jointed to allow it "to fall back when "required." The pressure of the rollers against each other is regulated by a weighted line. The hat body is soaked in one of the solutions; it is then drawn upwards between the rollers, and "the superfluous stiffening solution" will fall down a board pivoted "to slope towards the same compartment in which the "hat body had been immersed."

7. A machine for "covering hat bodies:"—Perforated cones revolve on hollow axles (through which steam can be admitted) in a water-tight box, and "conical riders or rollers" revolve by contact on the cones. On each cone is placed a hair cloth, on the hair cloth a hat body "having the fur previously laid upon "it and wetted," and on the hat body another haircloth. Hot water drops through perforated pipes on to the hat bodies, and a slow motion is given to the cones "until the nap has stuck." The cones are then made to revolve quicker, and steam is admitted for about 20 minutes, "by which time the nap will be sufficiently "scalded in." A continued admission of steam and a quicker revolution of the cones will "throw off the water from the hat

" body," and "the nap will be cleared, or in effect raised up in " readiness for blocking."

The connecting parts of the several machines, the methods of setting them in motion, and an occasional modification thereof, are explained in the specification.

The patentee claims also "the production of an improved sub-" stance or texture for hat bodies by means of the use or appli-" cation of a much larger proportion of non-felting materials than " has hitherto been used, viz., a proportion equal to one-third by " weight of the whole materials used."

[Printed, 1*s*. 8*d*. Drawings. See London Journal (*Newton's*), vol. 13 (*conjoined series*), p. 191; Rolls Chapel Reports, 7th Report, p. 187.]

A.D. 1839, January 12.—N° 7935.

PONSFORD, WILLIAM.—(*A communication.*)—"An improve-" ment in the manufacture of hats, and an improved description " of felt suitable for hats and various other useful purposes, and " improvements in preparing the material or materials chiefly " used in the manufacture of such felt." These improvements are "supplementary and auxiliary" to the invention for which Letters Patent were granted to Wm. Angus Robertson, dated April 4th, 1838, No. 7608.

1. Improvement in the manufacture of hats:— The felted bodies are made "wholly of cattle hair or of cattle hair mixed with other " materials." The hair is prepared by saturating it with muriatic or any other acid ("excepting only sulphurous acid") and then washing it in clean water. It is afterwards "passed through a " blowing machine, such as is in common use, and then formed " into a bat or fleece by means of mechanical arrangements " founded on the principle of exhaustion." About one-fourth of the materials used in forming a hat body may consist of "tow, " or dressed flax, or waste silk cut into short lengths."

2. Improved description of felt:—Cattle hair with or without an admixture of cotton, silk, tow, or dressed flax, is formed into a bat as before described and then passed between two or more sets of hardening rollers. If the materials do not felt readily after hardening, the bats are cut into pieces, rolled up into bags, and put into an apparatus consisting of a close cylinder, whose axle is hollow and "perforated all over," and whose inner periphery has " *cleets or ribs* of about two inches in depth and about ten inches

" distant from each other," fixed to it. The cylinder is filled " to the extent of one quarter of its depth with boiling solution " of sulphuric acid and water;" the bags are put on the cleets; a sliding door in the cylinder is shut; steam is admitted; the cylinder is rotated "at the rate of sixty revolutions per minute;" and in about twenty minutes the bats will be found "in a state " of excellent preparation " for

3. The planking machine:—This is improved by passing over each of the end sets of rollers an endless web of coarse cloth.

4. "A circular rubbing or brushing apparatus:"—An endless web is passed round two rollers mounted on a table, and immediately over them are other two rollers so that the bat is "carried " forward between the two sets." The table is perforated all over to let steam pass up, and a circular brush turning on its centre is arranged "to press more or less on the bat or felt as it " passes beneath." There may be several brushes of smaller size, or instead of brushes "circular pieces of wood or metal with " grooved, or diamond, or other figured faces in low relief."

[Printed, 10*d*. Drawing.]

A.D. 1840, February 8.—N° 8382.

HANCOCK, James.—" A method of forming a fabric or fabrics " applicable to various uses, by combining caoutchouc, or certain " compounds thereof, with wood, whalebone, or other fibrous " materials, vegetable or animal, manufactured or prepared for " that purpose, or with metallic substances manufactured or prepared." The patentee (inter alia) makes a fabric suitable for hat bodies and another for military caps. For hat bodies he weaves strips of wood, whalebone, &c. "in conjunction with a " flaxen thread or other fabric" as either warp or weft. He coats the fabric with his caoutchouc composition and then covers it " with silk, muslin, paper, or any common manufactured cloth," or with "sheet caoutchouc," uniting the whole by pressure.

For military caps he uses " metal wire woven in the usual and " well-known method as an intermediate substance."

His caoutchouc composition is made as follows:—Caoutchouc is steeped in coal tar oil, or oil of turpentine, or a mixture of both, sufficient to dissolve it. Pitch and either Archangel or Stockholm tar in equal quantities are heated in a steam bath, and whilst in a warm and fluid state the solution is added in the proportion of 1 *part of solution to* 11 parts of pitch and tar. Whilst the ingredients are mixing, they must be kept well stirred. If the composition requires thinning, tar is added to it, if thickening, pitch. The exact proportions "will depend on circumstances."

[Printed, 4*d*. Woodcut. See London Journal (*Newton's*), vol. 23 (*conjoined series*), p. 170; Mechanics' Magazine, vol. 33, p. 221; Inventors' Advocate, vol. 3, p. 99.]

A.D. 1840, November 21.—N° 8710.

WAKEFIELD, JOHN, and ASHTON, JOHN.—" Improvements " in the manufacture of hat bodies." This invention consists in using "slender strips of palm leaves, commonly called palmetto, " and sometimes called Brazilian grass," in the manufacture of hat bodies.

The bodies are made sometimes entirely " out of pieces of a " loom-woven tissue of strips of palmetto palm leaves;" sometimes "out of pieces of a compound loom-woven tissue of strips " of palmetto palm leaves woven in combination with yarns or " threads of cotton or flax;" sometimes "with the round sides " or cylindrical parts thereof in one piece of continuous loom- " woven compound tissue of strips of palmetto palm leaves " woven in combination with yarns or threads of cotton or " flax."

The specification contains a full description of the method of weaving.

"The flat circular tops or crowns" may be made of the same material as the sides or of any of the materials "usually employed " for the crowns of hat bodies." The brims (made of the ordinary materials) are fastened to the bodies "in the usual manner." The body is coated with a waterproof composition or is covered with "a thin muslin cloth saturated with the semifluid water- " proof;" it is then varnished and " covered on the outside with " cloth of the kind called plush or shag."

[Printed, 6*d*. No Drawings. See Mechanics' Magazine, vol. 34, p. 413; Inventors' Advocate, vol. 4, p. 340.]

A.D. 1841, October 7.—N° 9114.

BIGGS, THOMAS.—" Improvements in securing hats, caps, and " bonnets from being lost by the effect of wind or other causes." The patentee uses elastic strings or bands of such length, and so fixed that when required they can be drawn out so as to pass under the chin, but when not in use they will be out of the way *within the hat, cap, or bonnet.*

These bands may be applied in various ways. In a hat the patentee prefers to fix inside on opposite sides near the flat crown a metal holder; the band passes through the holders, and the ends are connected by a buckle or a clasp, or by sewing. In a cap he fastens the ends of the band either to the sides of the cap inside, or outside so as to lie "round the front." In a bonnet he sews the ends of the band "within the head of the bonnet."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 17 (*new series*), p. 264; London Journal (*Newton's*), vol. 22, (*conjoined series*), p. 303.]

A.D. 1842, December 8.—Nº 9544.

KEMPSON, William.—"Improvements in the manufacture of "muffs, cuffs, ruffs, tippets, mantillas, pillerines, dressing gowns, "boots, shoes, slippers, coats, cloaks, shawls, stocks, cravats, "capes, boas, caps, bonnets, and trimmings for parts of dress." The patentee uses in the manufacture of these articles "artificial "fur," viz., a knit or looped fabric having a close nap or pile produced thereon "by introducing, wool, hair, or other fibrous "material not previously made into yarn."

He makes the fabric either in an ordinary stocking frame of suitable width, and having applied thereto apparatus "for sup- "plying a sheet or sliver of wool or other fibre," or in a stocking frame "with warp guides applied thereto for inlaying the "fibres into the fabric" produced by the frame. He describes the additions made in each case and the "course of working."

The fabric thus produced is taken out of the frame and brushed upon the back surface with gum, size, or other flexible cement. A calico or other cloth fabric is secured to the back, and the artificial fur is ready to be cut up into the required shapes.

The patentee makes also fringes for trimmings in warp machinery. "In doing so," he states, "I remove or omit to apply "needles on the needle bar to an extent equal to twice the width "I wish to have the fringe part of the fabric produced in the "machine, and I leave or apply needles to such a width as I "propose to make a looped fabric for holding the fringe." The fibres used for producing the fringe "may be yarn or roving "with only sufficient twist put on to facilitate its being worked "through a guide." He describes the working of this machine.

[Printed, 3*s*. Drawings.]

A.D. 1842, December 15.—N° 9554. (* *)

KEENE, Charles.—" Improvements in the manufacture of " hose, socks, drawers, gloves, mitts, caps, comforters, and " cuffs."

This invention relates,—Firstly, to applying elastic bands made in warp lace machinery, by the introduction of india-rubber threads among threads of other materials, to the purpose of forming elastic welts or bands at the upper parts of stockings. The band is placed on the needles of the stocking machine, and the work is then knit thereon, " omitting the ordinary turning over " or welt at the upper part, as the elastic band above described is " in substitution of the ordinary welt." The band is to be rendered elastic, either before putting it upon the needles or afterwards, by means of heat, as is well understood.

Secondly, to " a mode of making gloves with elastic bands for " the wrists, and consists of employing woven fabrics made in " looms by means of warp and shuttle, so woven that at intervals " india-rubber is laid in to form elastic bands at the wrists."

Thirdly, to making what the patentee calls over-all hose, socks, and gloves, and also drawers, mitts, caps, comforters, and cuffs, and consists " of making such articles of elastic fabrics made of " woollen yarn in which india-rubber is introduced in all parts," the gloves " being intended to be worn over other gloves, and " hose and socks over the feet and legs, in order to obtain warmth " as over-alls." These fabrics may be produced either " by warp " and shuttle," or in warp lace machines.

[Printed, 4*d.* No Drawings. See Repertory of Arts, vol. 3, (*enlarged series*), p. 53; and Mechanics' Magazine, vol. 39, p. 30.]

A.D. 1843, June 15.—N° 9785.

OLDHAM, Thomas. — " Improved mode of manufacturing " bonnets and hats." These articles are made " of a double " cloth united in the weaving at equal distances throughout, and " thereby leaving narrow cases or openings parallel to each other " for the reception of canes."

" The lines of union of the double cloth are narrow, so that " the cases are as near to each other as it is practicable to make " them." Canes can be introduced into any part, consequently by putting two or more into adjoining cases, one into each, greater stability will be given to that part, and " by leaving an equal or

" unequal number of empty cases between the introduced canes, " any diversity of patterns capable of being made by the intro- " duction of canes can be produced."

Figure 1 in the sheet of drawings represents a bonnet " having " four cases side by side filled with canes round the front to give " stability to that part;" adjoining these are three empty cases, and then two filled ones, and so on to the crown; this succession " with the drawing of the cloth into folds or plaits upon the " canes " forms the pattern.

Figure 2 represents a hat " with four cases side by side, each " filled with a cane, and the next four cases empty;" this succession is continued throughout. "The top side of the brim is " covered by an extra piece of double cloth with all the cases " empty."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 3 (*enlarged series*), p. 102.]

A.D. 1843, October 5.—N° 9896.

SOLDI, John Baptiste.—(*A communication.*)—" Improvements " in apparatus for measuring of persons' heads, and for fitting " and retaining hats, caps, and bonnets according to such mea- " sure." This apparatus is made in two distinct parts, and when not in use " the smaller one is placed within the other one " and they are both placed on one plate." The larger one " consists of two discs or oval plates," one above the other, with a space between them for the admission of sliding pieces. These pieces have each a longitudinal groove which slides on a corresponding tongue formed on the lower plate. When this part of the apparatus is placed on the head (whereon it rests by aid of a spring), the inner ends of the sliding pieces are brought into contact with the head by an elastic spring " which acts on all the " pieces at the same time," and are fixed by screws; the action of the plates is regulated by springs. By this means " the exact " form of the contour of the head " is obtained.

" To obtain this contour upon an external surface " the smaller part of the apparatus is employed; it is constructed in a manner similar to the larger part, and being placed within it the outer ends of the sliding pieces are brought into contact with the inner ends of the others, and being fixed with screws will give " the " exact size required for the head."

[Printed, 6*d*. Drawing. See Mechanics' Magazine, vol. 40, p. 316.]

A.D. 1844, February 24.—N° 10,076. (* *)

BEDELLS, CALEB.—" Improvements in the manufacture of " bonnets, collars, capes, caps, shawls, cloaks, coats, gaiters, " scarfs, stockings, gloves, and mitts."

This invention consists,—Firstly, in making " a peculiar fabric " in stocking or knitting frames, suitable in the making of stockings and elastic bands for stockings, gloves, and other parts of " dresses requiring elastic bands;" this is effected by employing threads or strands of india-rubber covered by braiding or twisting, and causing such covered india-rubber threads or strands to be looped into a fabric by the working of stocking or knitting machinery, "and this may be done for making pieces of fabric to " be cut into bands or pieces to be applied to or let into parts of " the articles herein-mentioned."

Secondly, in making and applying an elastic fabric in twist lace machinery by placing in the lace machine a warp wholly composed of india-rubber strands, either covered or uncovered, "or else " every other warp thread of india-rubber, with every other warp " thread used therewith " of cotton, silk, or other spun yarn, and causing the material or materials to be worked by the machine in the ordinary manner. The result will be that when the fabric has heat applied thereto, it " will run up and offer the appearance of " a corded fabric of a peculiar character," which may be used in forming the elastic parts of "many of the articles herein-mentioned."

Thirdly, in forming, in warp machinery, " a fabric consisting of " looped cords in parallel lines or distances apart, laced or combined together with yarns or threads passing and linking with " alternate neighbouring cords," each cord containing a strand of india-rubber, covered or uncovered, which is worked into the fabric in the non-elastic state, and rendered elastic by the application of heat after the fabric is made. A "cut of wheels" suitable for making this fabric is shown in the drawings annexed to the specification; and the fabric itself may be applied for making several of the articles mentioned herein, and parts of others of such articles.

The fourth part of the invention consists in making certain elastic fabrics in "shuttle looms," which may be applied "in " various parts of the articles herein-mentioned;" and a fifth part of the invention consists in applying elastic india-rubber fabrics

" to form the part of the glove which embraces the hand;" this may then "be placed upon the needles of a stocking or warp " frame, and have the fingers formed thereto in the usual manner " of making the fingers of gloves in stockings or warp machinery." This part of the invention may be variously modified.

[Printed, 10*d.* Drawings.]

A.D. 1844, March 28.—N° 10,123.

JOHNSON, ALFRED RICHARD.—" Improvements in hats." The patentee renders all sorts of hats "more pliable, elastic, and " easy of wear" by "adding to or introducing into the body of " the same a layer of caoutchouc or india-rubber in the sheet " state."

" After the foundation of the hat has been formed as usual" he adds to it a covering of linen or cotton cloth, then a layer of sheet caoutchouc, and over that a second covering of linen or cotton. "The body thus completed is then roughed or plated " and finished in the usual way."

[Printed, 4*d.* No Drawing. See London Journal (*Newton's*), vol. 25 (*conjoined series*), p. 394.]

A.D. 1844, May 14.—N° 10,180.

BROWNE, JOHN.—" Improvements in apparatus for protecting " the human face or part of the human face from the inclemency " of the weather."

[No Specification enrolled.]

A.D. 1844, June 6.—N° 10,220.

CHEETHAM, DAVID, and BRIGGS, EDWARD.—" Improvements in the manufacture of hats, and in the machinery or " apparatus connected with such or similar manufacture."

1. Machinery for "setting up" hat bodies on blocks:—Two cones rest upon other two cones and revolve "by friction of con-" tact" with them. The lower cones are driven by suitable gearing; they are mounted on a carriage which moves backwards and forwards "by means of a mangle rack and pinion;" the speed is regulated "by a pair of cone pulleys, the strap passing " round which is acted upon by a heart wheel or cam."

2. Machinery for "basoning" the hat bodies :—This consists of a table and "a block of wood suitably weighted." The bodies (previously steamed) are laid on the table; the block is placed on them, and "a short quick reciprocating motion" is given to the block. The bodies "are then rolled up in a cylindrical form" and are taken to—

3. The planking apparatus :—A cistern contains an acid solution which is kept heated. A little below the surface of the solution is a perforated board whereon the rolled-up bodies are placed. "Light blocks are then lowered upon them;" and the blocks, "having a short horizontal reciprocating traverse imparted to them," "roll the bodies backwards and forwards on the board."

4. A singeing machine :—The hat body (on a conical block) is placed on a spindle "which is caused to revolve slowly," and a flame of gas is made "to impinge upon the outer surface of the body."

5. Machinery for forming the fur into a sheet before applying it to the body :—The fur is laid on "a travelling feed cloth which conducts it between two rollers into a chamber, at the feeding end of which is a rotary beater." At the other end of the chamber is a cylinder covered with fine wire cloth and "connected by a flue to a fan above." The fan revolving draws the air "through the cylinder, which will lay the fur upon it in a sheet." The fur is thence "delivered on to a table which traverses slowly backwards and forwards for the purpose of laying the web or sheet in even folds throughout."

6. The sheet of fur has "density or tenacity" given to it by laying it on a table covered with oil cloth and under a board whose under side is covered with oil cloth. The board "has a reciprocating motion given to it." The patentees call this "a hardening machine."

7. Machinery for raising the pile :—The novelty in this consists chiefly in the "application of a band or belt with pins fixed therein, or other holding or distending apparatus, to the selvages of the plush;" the plush is thereby kept distended "whilst a band of card wires is passing transversely over it."

A machine for "sponging, luring, brushing, and ironing the plush" :—Water constantly drops on to a sponge fixed to the under side of a perforated block. The plush passes under the *block; thence* under two rollers, one covered with velvet or plush, the other with bristles; and afterwards "between a heated cylin-" der and a hollow semicircular plate of metal."

The details of each machine are given in the specification.

[Printed, 2*s*. Drawings.]

A.D. 1844, September 12.—N° 10,310.

SIMPSON, Alfred.—" Improvements in the manufacture of " hats." The patentee claims (1) two compositions for stiffening the bodies of silk and velvet hats and the sides of gossamer hats; (2) the use of metal blocks, metal plates, metal bands, and peculiarly shaped metal tools in the manufacture of his hats; (3) the use of "tissue straw" for the tops of gossamer hats.

One composition consists of 40 gallons of cold linseed oil, 29 lbs. of crude litharge, 27 lbs. of powdered Turkey umber, 19 lbs. of white lead, and 5 lbs. of finely sifted China clay, boiled together slowly for 6 hours; when the composition is cold it may be thinned with turpentine.

The other composition is intended for the finer sorts of silk hats; it is made by mixing 6 quarts of oil (gradually and in a boiling state) with 8 oz. of melted gum copal; this also may be thinned when cold with turpentine.

Metal blocks, &c. are required "to resist the heat to which they " are exposed."

The manufacture of silk or velvet hats:—Put a woollen or stuff body on a metal block; dip it into water for about one minute; drain it, and rub in one of the compositions (the consistency should be about that of cream). Place a metal band round the body "at that part where the hat-band is worn." Spread out the part which is to form the brim on an iron plate, but do not cover the brim with composition; it is to be "stiffened and " finished in the ordinary way." Put the whole for 6 hours into a stove heated to not less than 175° Ft. Take the body off the block with the iron tool (for the shape see the sheet of drawings); put it on a wooden block; smooth it with pumice stone; paste it over and varnish it; it is now ready for the covering of the silk or velvet.

Gossamer hats:—Dip the woven material of which the side of the body is made into water, and while wet apply on both sides either composition. Rub the metal block over with sweet oil, and wrap round it thin paper or silk. Frame the side on the block, "taking care to let the material lap over about half an inch." Put the whole for 3 hours into a stove heated to 175° Ft. Take the side off the block with the iron tool; remove the paper or silk if it has become attached to the side; block on a wooden block; fasten on the top and the brim, and finish off the hat in the usual way. For lightness' sake "tissue straw" may be used for the top of the hat.

"In hats having the crown wider at the top than the bottom" the metal block requires to be made with "an ear with two slots" and thumb screws.

[Printed, 8*d*. Drawing. See London Journal (*Newton's*), vol. 26 (*conjoined series*), p. 158.]

A.D. 1845, January 11.—Nº 10,463. (* *)

ROSS, JOHN.—(*A communication.*)—"Improved machinery for "platting or braiding straw, grass, and other materials principally "designed to produce what is called or known as tuscan or leg-"horn braided straw for hats and bonnets."

This invention is described at some length, and by reference to several sheets of complex drawings, but the main features of the invention consist,—

Firstly, in a mode of supplying the straw, grass, or other material of which the fabric is to be composed, to the machine, by means of a rotating wheel carrying "forceps," which hold the material when required, and which wheel "is also capable of "carrying away the empty forceps to be again supplied and "returned to the machine."

Secondly, in an arrangement of parts "for throwing the forceps "containing the straw, grass, &c., from side to side of the ma-"chine, and holding them up at certain times to allow the platting "movements to proceed." This is effected by means of fingers "mounted on horizontal axles, to which a simultaneous recipro-"cating motion is given, and which fingers are furnished with "sockets by means of which they lay hold of the forceps as "required, the latter being supported in sockets in the wheel "which carries them."

Thirdly, in an arrangement of "beaters," which are made to beat up the plait or braid "after every throw of the forceps."

[Printed, 1*s*. 6*d*. Drawings.]

A.D. 1845, January 21.—N° 10,490.

SMITH, John.—(*A communication.*)—" Improved means and " apparatus for shaping hats." This invention has reference only to the brims of hats; it " consists essentially in the employment " of hollow moulds (heated by steam or other convenient means) " which are formed so as to give the proper shape to the brims of " hats when pressed down upon such moulds by properly shaped " weights."

The moulds (of metal) are mounted on a framing; they are shaped on their upper surfaces " according to the style of hat brim " desired." Each has two pins rising from the face for keeping the wooden hat block in a central position on it. Each is in connection with a steam pipe (which lies horizontally along the framing) by means of a branch pipe which conducts steam into the interior thereof; each branch is provided with a stopcock. The waste steam &c., is drawn off from the moulds by pipes which open into a waste pipe. By preference one of the moulds, the one whereon the hat is first placed, is flatter on its upper side than the others, " which are finishing moulds of various patterns." The weights, usually of lead, are " cast to the form of the face of " the mould and made to embrace the hat and cover nearly the " whole of the brim."

The brim of the hat requires to be wetted before it is placed on the first mould, and the inventor has found by experience that " one minute and a half is sufficient for softening the hat brim," and that about the same time is required " to shape it on the " finishing moulds."

[Printed, 1*s*. Drawings. See London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 245.]

A.D. 1845, March 20.—N° 10,572.

STOWELL, Anna Maria, and LITTLE, Thomas.—" Im- " provements in the manufacture of ladies' bonnets or hats." " The practical character " of this invention consists in varied combinations of materials " in woven tissues or fabrics effected " by the ordinary methods of weaving."

The materials used for the warp are any one or more of the following:—" Willow, cordinet, silk cord, ribband, velvet strips, " fabrics or threads of gum caoutchouc or its compounds, or any " fabric simple or compounded of flax or cotton."

For the weft one or more of the following may be used:—"Velvet in strips or in other forms, ribband of any description, "cordinet, willow or chip, straw of any description and in any of "its ordinary states of preparation, silk cords or braids, chenille, "manilla grass and all other grasses, gimp, glass in threads, "Berlin wool in its ordinary state of preparation, gold or silver "threads or their compounds, the threads of other metals or "their compounds, any kind of fancy trimmings simple or compounded of different materials, as cotton, silk, horse hair, camel "hair, whalebone, cane, or any vegetable and fibrous substance."

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 27 (*conjoined series*), p. 408.]

A.D. 1845, April 7.—N° 10,602.

GALIBERT, Esprit.—"Improvements in hats." The first improvement consists in "forming the foundation of the brim of "silk hats" of "a single texture of cotton of about the three or "four times the ordinary thickness of English cottons."

The second, in introducing into the body of both silk and beaver hats, at those parts where they come into contact with the head and into the brim for the space of about an inch round the orifice, "a layer and in some cases two layers of the membrane which is "formed from the intestinum rectum of animals." This membrane prevents "any grease or oil from the head" passing through the hat. In silk hats the membrane is placed between the two pieces of calico of which the body is formed, or between that body and the leather or other lining, or immediately under the silk. In beaver hats the membrane is put between the body and the leather or other lining.

[Printed, 4*d*. No Drawings. See London Journal (*Newton's*), vol. 27 (*conjoined series*, p. 264.]

A.D. 1845, June 23.—N° 10,732.

WHITING, Henry.—(*A communication.*)—"Improvements in "machinery or apparatus for shaping the brims of hats." By aid of this apparatus "the turning up the brims of hats is readily "and expeditiously effected, and any required form or pattern of "brim (independently of the skill of the workman) is produced."

A steam chest is provided with small orifices for the exit of jets of steam at certain periods, and over the chest is placed a cloth "having a coiled spring sewn round its edge." Two cords are threaded through the spring, "similar to the mouth of a purse." Above the cloth is "a plate to support the hat which is secured " in its proper position by means of an expanding oval or block " capable of fitting the interior of any size of hat." A shape, composed of two thin strips of metal of the size and form of the brim to be made, "is then laid on the brim of the hat and held " down while the operation is proceeding." Steam passes through the cloth and impinges on that part of the brim "which is not " covered by the plate immediately below it," making that part soft and pliable. The cords are then drawn tight, and "by the " contraction of the spring the cloth will be drawn over the shape " on the hat brim and turn back the exposed and softened part " of the brim over the shape."

The inventor claims the construction of the oval block:—A bed plate has in its middle a "circular opening" over which "a " face wheel" is placed and secured by guide rollers. Two pinions mounted each on a threaded shaft take into the wheel. Each shaft bears a crosshead pinned to a bent plate, and springs secured to the plates form the ends of the block. The ends of the springs " are overlapped by shorter springs" which form the sides of the block. A shaft revolving between the side springs has one end formed into a right-handed, the other into a left-handed screw. These screws "pass through double inclined planes" which " slide over corresponding inclines" on the end springs and " push out their ends to form a wider oval."

A simpler construction of block:—Two springs "are drawn " together or separated in a longitudinal direction" by a handle fixed on a rod which has a right-handed screw at one end and a left-handed screw at the other; the screws turn in sockets affixed to the springs. At each side of the springs inside "are two " angular pieces or inclines" sliding in slots in a "stationary " piece."

Details of the whole apparatus are given in the Specification.

[Printed, 10*d*. Drawing.]

A.D. 1845, July 3.—N° 10,751.

SIMMONS, WILLIAM.—"Improvements applicable to hats, " caps, and bonnets." The patentee claims "the introduction of " a reflector or mirror into the crown of an ordinary hat, cap, or " bonnet." He prefers that the reflector should be "convex and

" made of thin light glass;" it "must be silvered inside." Any polished metallic surface however may be used, and it may be " concave or plane."

The reflector may be applied "by pasting or gluing a piece of " paper with a circular aperture just extending over the edges of " the circular mirror" on to another piece of paper "fitting the " crown of the hat as an ordinary lining," and the whole is then to be covered with "an interior lining of silk, satin, or other " material, having also an aperture or opening in it, through " which the mirror is visible."

[Printed, 4*d.* No Drawings. See London Journal (*Newton's*), vol. 28 (*conjoined series*), p. 110.]

A.D. 1846, January 13.—Nº 11,037. (* *)

BENBOW, THOMAS MOORCROFT.—(*Partly a communication.*)—" Improvements in fastenings for surgical and other bandages, " and for articles of dress."

The first part of this invention relates to fastenings which are applicable to stays as well as to bandages:—A strip of whalebone or metal is enclosed on each edge within the fabric to be united. Each strip has several semicircular pieces cut out of the outer edge, and at each indenture is fixed an arm carrying a pulley so arranged that the pulleys "do not project or project but slightly beyond the edge" of the whalebone or metal. The cord is connected at its ends so as to form an endless cord; "beginning at " the upper part it passes over the two upper pulleys;" then from one side to the other "over alternate pulleys to about the middle," where on each side " there are eyelet holes through which it passes, and thence " back again over the other pulleys." The stays are fastened "to any required degree of tightness" by tying together the portions of the cord left beyond the eyelet holes.

The second part relates "to the formation of hooks" to fasten articles of dress:—Additional fastening parts "are placed close to " the part of the hook which is turned up to pass into the eye," an arrangement which prevents the hook from hanging loosely."

A hook, particularly applicable in fastening the parts of gloves together at the wrist "is formed with an eye at the back;" or an equivalent for the eye may be made "by the bending of the stem." A tassel or ring is attached to this eye or bend, and by pulling it " the hook will readily be released from its eye."

The third part relates "to the formation of eyes used with "hooks":—The parts by which the eye is fastened to the garment "are brought close together," and the part over which the hook passes "is shortened so as to prevent the collapsing of that "part."

The fourth part consists in covering springs "used in making "caps and other articles of head dress to retain them on the "head":—The covering may be of any material and be applied in any convenient manner, the object being to prevent the springs from "being corroded by moisture from the head."

[Printed, 6*d*. Drawing. See Repertory of Arts, vol. 8 (*enlarged series*), p. 175; London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 99; Patent Journal, vol. 1, p. 168.]

A.D. 1846, January 27.—N° 11,059.

ROSS, DANIEL.—"Improvements in the manufacture of hats." The brims and head bands of such hats as are formed upon calico or linen bodies are made of elastic materials.

The following is the process of manufacture:—A body of single calico "proofed and stretched" is placed upon a block, and the depth of the hat and of the head band being settled, "the body "is cut of such a depth as to allow a depth of about an inch for "its juncture with the head band."

The material of which the head band and the brim are made is a fabric known as "elastic web, in which one set of threads is "composed of linen or cotton yarn, and the cross set of threads "is composed of strands of caoutchouc." The fabric is so applied that the strands of caoutchouc "lie horizontally;" those of the linen or cotton yarn "stand vertically in the head band and in a radiating position in the brim." The fabric is prepared "in "strips of such width as to form the brim and head band in one "piece."

The head band is attached to the body "by applying to the "outside of the lower edge of the body a layer of spirit varnish "to the depth of about an inch" and then pressing the band to the calico with a moderately hot iron. "The seam of the head "band is then made "by overlapping the two edges and securing "them together by means of small tacks and then varnishing "and ironing the seam." The block is now placed in the frame, and the web is stretched and nailed to the frame so as to form the brim, "the seam being formed in the same way as the seam

" of the head band." The whole being now coated with waterproof composition and set before the kiln to dry, the other calico covering is put on; it extends only " to the upper edge" of the head band, its lower edge being turned in " to make it of the same " thickness, or nearly so, as the head band." The whole now receives a coat of waterproofing; when dry the nails are drawn out, and the brim is ironed round. " A flat ring of calico " is placed on the upper side of the brim; it extends to within about a quarter of an inch from the head band and receives a coat of waterproof composition. " Another and wider ring of calico is " then drawn over the body so as to cover the entire brim and a " portion of the head band." The whole is now finished in the usual way, and a coating of oil or other suitable varnish is applied to both head band and brim to restore their elasticity.

[Printed, 4*d.* No Drawings. See London Journal (*Newton's*), vol. 29 (*conjoined series*), p. 29; Patent Journal, vol. 1, p. 181.]

A.D. 1846, June 18.—N° 11,246.

JOHNSON, ALFRED RICHARD.—" Improvements in hats, caps, " and bonnets." The first part of this invention relates to a composition for stiffening hat bodies, and cementing together the parts of bodies, and to forming such bodies. The composition is made by adding to shellac dissolved in any suitable solvent a solution of gutta percha in proportions varying from 1 part of gutta percha to from 6 to 12 of shellac; the mixture should be made while both solutions are warm. The fabric to form the body is saturated with the composition, stretched, dried, cut up into sides, tips, &c., and shaped by blocking. The body is then coated evenly with the composition and when dry ironed all over.

The second part, to " a combination of shola, pith, cloth, and " cement " for hat bodies:—The shola or pith is sliced into strips which are cemented on both sides to " pieces of jaconet muslin or " any other slight fabric."

The third part, to ventilating hats, caps, and bonnets:—A valve opened and closed by a screwed spindle is inserted into the crown, and a " back air piece " (of thin cork with grooves on its inner face) between the body and the leather. " The leather is brought " over the top of the air piece and perforated on the edge just " *inside* of the stitching."

The fourth, to "a new covering for the outside of hats:"—This is an elastic fabric composed of a warp of threads of caoutchouc wholly or partially covered with threads of wool or silk or a mixture of the two, or of caoutchouc threads mixed with woollen or silk threads, and of a weft of threads of wool or silk or a mixture of the two. Or the warp may be of threads of wool or silk and the weft of caoutchouc threads as before-mentioned. Or the caoutchouc threads "may be used in an uncovered state." The patentee prefers "to have the fabric woven in circular and endless "pieces."

The fifth, to "forming mourning and other hat and cap bands "of the elastic fabric" last described. These the patentee prefers to make "circular without seams."

[Printed, 10*d*. Drawing. See Mechanics' Magazine, vol. 46, p. 134.]

A.D. 1846, August 20.—N° 11,345.

PARRY, HENRY.—" Improvements in the manufacture of hats." The object of this invention is the manufacture of a hat which "shall be covered with nap, and partly uncovered or without nap, "in order that the same may assume the appearance of hats "partially covered with crape, cloth, or other material, as worn "by persons in mourning."

The hat may be made of a felted stuff body or any other description of body, and the covering of nap or material to form nap may be put upon portions of the hat "at any of the stages of the pro"cess of hat making" at which hat bodies are usually covered with nap. Or the whole of the outer surface of the body may be covered with nap, and the nap may be "afterwards cut, burnt, or "otherwise taken from such part or parts of the hat body as may "be intended to be bare or not covered with nap." Or the nap "may be raised upon those portions only of the hat which are "intended to possess a nap."

In white hats or hats of any colour except black the portion not covered with nap "may be printed or coloured black."

In silk hats the portion which in other hats is uncovered is covered with cloth. "The edges of the pieces of plush and cloth "where they meet together all round the hat must be even and "straight," and "it will generally be found best to sew or other"wise fasten them together all round the hat where they join."

[Printed, 10*d*. Drawing. See London Journal (*Newton's*), vol. 30 (*conjoined series*), p. 151; Patent Journal, vol. 2, p. 652.]

A.D. 1846, October 15.—Nº 11,413.

DURAND, FRANÇOIS, and PECQUEUR, ONESIPHORE.—"Improvements in forming leather into tubes, cylinders, switches, "cases, sheaths, hats, and other articles." The specification contains long descriptions "of arrangements of machinery for split-"ting bands or other forms of leather into tubes, cylinders, and "other articles, in such manner as to obtain the required form with-"out sewing or gluing, the sides being formed by the portion of "the leather not cut." As there is no mention of hats in either of the descriptions it is uncertain which arrangement is to be employed for the purpose.

One machine "is more particularly intended for the manufac-"ture of scabbards and sheaths for swords and other arms;" another "more especially for cutting bands of leather into tubes "and pipes;" another "for the manufacture of leather bottles "from bands of leather, or other vessels where the necks or "entrances thereto are smaller than the body part;" this machine is applicable to the manufacture of shoes.

Other parts of the specification describe "another machine for "splitting leather without sewing or gluing," and an arrangement which "is only applicable for cutting cylinders for spinning "purposes and other objects when the cut is required to be short "and straight."

[Printed, 2*s*. 8*d*. Drawings. See Patent Journal, vol 2, page 280.]

A.D. 1846, November 19.—Nº 11,455.

BROCKEDON, WILLIAM, and HANCOCK, THOMAS.—"Improvements in the manufacture of articles where india-rubber "or gutta percha is used." The processes of vulcanizing, purifying and colouring these substances (included in the term "change") are those described in the specifications of letters patent previously granted to Mr. Thomas Hancock and to Mr. Alexander Parkes.

Leather, cloth, linen, silk, and other fabrics and materials are rendered partially or entirely waterproof "by coating their surfaces "or uniting two or more of them together with caoutchouc, "gutta percha, or a compound of these matters in a state of solu-"tion or otherwise, as described in the patents of the said Thomas "Hancock." The change is then produced "by immersion;" this forms the difference between the present and the former inventions, the operating being "on the manufactured article in

" place of acting on the raw material of caoutchouc, gutta percha, " or the compounds of these materials." To protect substances " liable to injury by contact with the changing solvents" they are coated or saturated with "glue size" which is afterwards removed by rinsing in warm water, or with " an aqueous solution " of lac" which is afterwards removed by any suitable alkaline solution.

From the foregoing materials the patentees make "a great " variety of articles," among which are mentioned hats, caps, bonnets, hat linings, hat-bands, cloaks, capes, coats, overalls, fishing stockings, collars, stocks, gloves, gaiters, shoes, boots, soles, goloshes, and aprons.

If the exterior of the article is to be of cloth or other texture they "protect the fabric when producing the change from the " action of the changing agent by forming the air-proof lining in " such a manner as to cover the whole interior of such fabric and " obtain the change by pouring in the changing solvent, allowing " it to remain only for the necessary period." When the articles " require seams or to be otherwise sewed together," the waterproofing solution employed in such parts " will require afterwards " to undergo the change by applying the converting solvent with " a brush or otherwise."

[Printed, 6*d*. No Drawings. See Repertory of Arts, vol. 10 (*enlarged series*), p. 103; Mechanics' Magazine, vol. 46, p. 504.]

A.D. 1846, December 21.—N° 11,512.

MYERS, George David, COOPER, William, and WANSBROUGH, James.—" Improvements in the manufacture of caps, " bonnets, book covers, curtains and hangings, show cards or " boards, labels, theatrical decorations, and coffins." This invention consists in applying "in such manufactures the process " of flocking and flocked fabrics." No claim is made to the method of applying the flock. In the manufacture of caps flock is applied "to one surface of the woven fabric of cotton or of " linen," and the cap is made up in the ordinary manner with the flocked surface outside. Or the cap "may be first made up, and " either stiffened or not, and then flocked."

Bonnets are made "to the shapes and forms desired, by using " cardboard or proper stiff preparation of paper," and by applying flock to the exterior surfaces.

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 10 (*enlarged series*), p. 249; London Journal (*Newton's*), vol. 31 (conjoined series), p. 205; Patent Journal, vol. 3, p. 149.]

A.D. 1846, December 31.—Nº 11,513.

DOWSE, Charles.—"Improvements in applying springs to "braces, to portfolios, to hats and caps, and memorandum and "other books." These springs are made of vulcanized india-rubber.

In applying these springs to braces, a ring of the prepared rubber, or a piece with suitable holes therein, or a piece with four projecting ends is used. The front and back portions of the braces (by preference strengthened with canvas on one side) are attached to the ring, &c. by sewing. The front ends (which are buttoned to the trousers) are attached in like manner, or they may be made of one piece "either alone or combined with can-"vass;" this piece may be passed either through the ring or over the tongue of the buckle.

In applying them to hats and caps, the ordinary straps for keeping a hat or cap are attached at one end to the hat or cap and at the other to a ring or rings.

[Printed, 1*s*. 2*d*. Drawings. See Repertory of Arts, vol. 10 (*enlarged series*), p. 80; Patent Journal, vol. 3, p, 177.]

A.D. 1847, December 22.—Nº 12,005.

STAMP, Robert.—"Improvements in the manufacture of fabrics "to be used for covering hats, caps, and bonnets; which fabrics "may be used for other articles of wearing apparel."

[No Specification enrolled.]

A.D. 1848, June 24.—Nº 12,191.

WALKER, Deane Samuel.—Improvements in the manufacture of bands for hats. The original title was "Improvements in "the manufacture of bands or straps for hats, caps, shoes, and "stocks," but on Dec. 23rd, 1848, the patentee entered a Disclaimer to the use of the words "or straps" and "caps, shoes, "and stocks."

For the body of a hat he uses a band of "tubular weaving;" this he stiffens in the customary method and affixes to it a crown "of looped fabric or other material" and "a brim as heretofore." He covers the body with a band of tubular weaving having a pile or not and secured to the body with cement; the crown and brim "are to be covered as heretofore." The object aimed at is the *avoiding "seams or joints"* in the body and its cover.

For mourning hat bands he uses (1) "tubular bands;" (2) lengths of cloth "cut on the cross," coated on the inside with a thin coating of india-rubber, sewn together at the ends, and having the seam covered with tape or other fabric cemented thereon; (3) "india-rubber bands coated over with flock."

[Printed, 4*d*. No Drawings. See Repertory of Arts, vol. 13 (*enlarged series*), p. 175, and p. 177, for Disclaimer; London Journal (*Newton's*), vol. 33 (*conjoined series*), p. 416; Mechanics' Magazine, vol. 49, p. 646; Practical Mechanics' Journal, vol. 1, p. 254; Artizan, vol. 7, p. 130; Patent Journal, vol. 6, p. 125.]

A.D. 1849, January 25.—N° 12,442.

TYLER, JOHN TALBOT.—"Improvements in hats, caps, and hat " cases." The hats are made with a crown shaped like " that of " a helmet," that is, " of a more curvilineal and therefore more " convenient and better wearing shape than usual, and of such " an articulate or jointed structure both in the crown and brim that " they can be readily folded flat or re-expanded into their original " shape."

In felt or beaver hats the stiffening composition is left out in the parts where the folds are to be, or is discharged therefrom by " a hot solution of salts of tartar, borax, or some other chemical " equivalent." As the brim before and behind "would be left " unduly weak from the three unstiffened parts," the whole (except the fold in the middle of the front and back) is stiffened; the front and back are cut through obliquely, so that the cuts meet in a point, and edges are applied " of whalebone or metal or " some other rigid material covered with silk."

In silk hats the body is cut "quite through in the lines of the " intended folds," and the edges (left a small distance apart) have cemented to them a strip of india-rubber, cotton, or other suitable material.

Caps (of whatever shape) are made " of one single piece," and are jointed to fold up flat by a process similar to that described for felt hats.

The hat case is square or oblong; an inner case rests on a false bottom, forming thereby a recess for papers, &c.; it is secured to the outer case by bolts concealed by flaps. The inner case is divided into a central compartment for the hat, two side compartments, and three open spaces. A tray "fits into and over the hat and rests " by two projecting metal plates on the top edges of the " outer case." There is a space between the backs of the cases for a portfolio. The lid is hollow and has a separate lid secured by a bolt and hasps.

[Printed, 10*d.* Drawing. See Patent Journal, vol. 7, p. 227; London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 99; Mechanics' Magazine, vol. 51, p. 92.]

A.D. 1849, March 28.—N° 12,546.

VOUILLON, FRANÇOIS.—"Improvements in making hats, "caps, and bonnets." The body (of felt, leather, or other similar material) is shaped by aid of a machine of the following description:—A steam box is provided at or near its bottom with a steam pipe, a waste pipe, and a disc which causes the steam to be divided and "properly diffused throughout the box." The block (covered with copper or brass) is suspended from a revolving holder which is connected to the lower end of a screwed rod. The rod passes through a screw at the upper end of a standard; it carries a hand wheel and "to facilitate the operation a weighted "chain or cord."

The body is soaked in water and strained over a "circular brim "shape" to which it is secured by a metal band and a tangent screw. The brim piece is placed on the upper edge of the steam box; it is made with a groove round its under side to receive the edge of the box and to allow of its being turned round if required. Steam is admitted; the body is "thoroughly warmed;" the block is gradually brought down and "forces the strained felt through "the centre opening of the brim piece." Before the block and brim piece are removed they are connected by a cramp or hooked bar, so that the whole may be taken away together, and left together until the body is dry and the shape properly set.

The parts of the apparatus with which the felt is likely to come into contact should be made of some metal or material which is not liable to injury from water.

[Printed, 10*d.* Drawing. See London Journal (*Newton's*), vol. 35 (*conjoined series*), p. 388; Mechanics' Magazine, vol. 57, p. 332; Patent Journal, vol. 8, p. 32.]

A.D. 1849, April 3.—N° 12,561.

DUNINGTON, HENRY.—"Improvements in the manufacture "of looped fabrics, and in the making of gloves and hat bands." The patentee on October 2nd, 1849, disclaimed the use of the words "and hat bands."

The material for gloves is cut out in four parts, the peculiar shape of which is shown in one of the annexed sheets of drawings. " By this arrangement," says the patentee, "gloves will be more " readily cut out and put together, and the various small parts " heretofore employed will be dispensed with." Of the parts one constitutes the portion which comes to the front and to the back of the hand, having an opening to receive the thumb; one forms the thumb, the other two "come at the back of the third and " fourth fingers." The Specification explains which edges are to be sewn together, and how the forefinger and the little finger are produced.

[Printed, 10*d*. Drawings. See Repertory of Arts, vol. 14 (*enlarged series*), p. 341; Mechanics' Magazine, vol. 51, p. 334; Patent Journal, vol. 8, p. 16.]

A.D. 1850, January 29.—N° 12,955.

NEWTON, William Edward.—(*A communication.*)—"Im- " provements in machinery or apparatus for making hat bodies " and other similar articles." The machine described is "for " forming the bat, or as it is termed, setting up the body." At one end of a frame is "mounted an exhausting fan with a cham- " ber" over which is set "a former" of any desired shape and made "of thin metal perforated with fine holes." The former stands in the groove of a rim carried by a vertical shaft, "so that " it may be set in and removed readily and yet as near as pos- " sible make an air-tight joint." It is placed in front of the mouth of a horizontal tunnel, at the other end of which is a revolving brush. The fibres are fed to the brush by means of two feed rollers covered with cloth. Below these rollers "and in " the curve of the brush," are two similar rollers covered with cloth, "against which the fibres are brushed by the rotation of " the brush, the surface of these rollers forming a curved bed " against which the brush acts, whilst at the same time they " continue to hold the fibres for the brush to act on them after " they have been liberated by the feed rollers." Air is admitted into the tunnel "between the bottom and the lowest of the rollers" through an aperture provided with a valve which is worked by an arm and a cord.

The bottom of the tunnel "is flat and gradually narrowed from " the brush to the mouth;" the sides are made of sheet copper " sufficiently thin to admit of bending with facility," so that the mouth can "be changed to regulate the deposit of the fibres on to the "former." The top is flat "and fits within the sides;" its forward end "which is wedge-formed extends a little beyond the "sides;" to the projecting end are attached bars "which pass "along on the outside" of the sides and "are connected again "with the top at the back end," so that "when the forward end "of the top is depressed or elevated, the flexible or pliable sides "follow," and the upper part of the mouth "will always present "the same size." The top is held at any desired elevation by a cord attached to any part of the frame.

The gearing required for moving the several parts is described in the Specification.

"So soon as the required thickness of bat has been obtained, "it is to be surrounded with a moist felt or fulled cloth," and this must be done "before the pressure of air is taken off." A metal cap perforated with large holes "is put on over the felt "covering;" a similarly perforated metal shield is placed inside the former, and the whole is "immersed in hot water to harden the "bat." After immersion "the bat will be sufficiently hardened "to admit of removing it from the former."

[Printed, 10*d*. Drawing. See London Journal (*Newton's*), vol. 38 (*conjoined series*), p. 11; Mechanics' Magazine, vol. 53, p. 99; Patent Journal, vol. 9, p. 225.]

A.D. 1850, December 2.—N° 13,380.

WATSON, Thomas.—"Improvements in the manufacture of "hat plush, and also in machinery or apparatus employed in "such manufacture." The first improvement consists in the "employment of spun silk of every description" for the weft of the fabric from which the plush is raised; the silk is to be dyed "in the hank or subsequently to the spinning process and pre-"viously to its being woven." The second consists in a "novel "method of dressing and finishing such or similar raised hat "plushes and in an arrangement of mechanism adapted to such "purposes."

The apparatus employed is composed of (1) a furnace havin its upper part covered in by an arch of cast-iron or other suitable material; (2) a driving shaft "actuated in any convenient manner;" (3) two levers mounted on the ends of the shaft and connected by tension rods so as to form a frame; (4) a calendering roller, and (5) a rotary brush, both carried by the levers;

(6) two rollers covered with worsted plush or velour, the one for giving a gloss and finish to the plush, the other acting against the back of the fabric "for the purpose of dragging the same;" (7) a roller covered with cloth and revolving in a trough, the water in which "must be kept at one uniform height;" (8) three tension rollers for keeping the fabric distended; (9) a roller provided with a ratchet wheel and catch and connected to the frame by straps and springs; (10) a roller round which the finished plush is wound; (11) spur gearing and pulleys for actuating the several parts. The process of finishing hat plush by means of the apparatus is described in the Specification.

If an extra of gloss or finish is required, "an additional rotary "brush made of fine soft hair, such as camel's, and revolving "rapidly, may be employed between the calendering and velour-"ing rollers."

[Printed, 8*d.* Drawing. See Mechanics' Magazine, vol. 54, p. 459; Patent Journal, vol. 11, p. 133.]

A.D. 1851, February 24.—N° 13,524.

HINKS, JOHN, and VERO, JAMES.—"Improvements in the "manufacture of hats, caps, bonnets, and other coverings for the "head." This invention relates principally to hats, and consists in rendering them "impervious to liquids without losing their "flexibility." 1. "Rendering hats of felt waterproof:"—The under side of the brim and the inside of the crown are brushed over with caoutchouc dissolved in oil of turpentine or other solvent, or with "Macintosh's paste or varnish" mixed with oil of turpentine to about the consistency of cream, "until the "solution appears slightly on the outside of the hat." The hat is then put into a stove and kept there "until the solvent is "evaporated." The brim and the crown or tip may if required be stiffened by the ordinary methods.

2. Waterproofing "and preparing hat bodies made of felt and "knitted fabrics, to be covered with velvet, silk," &c.:—The hat body is placed on a block and coated five or six times with either of the solutions; it is afterwards coated with the ordinary hat varnish.

3. "Waterproofing varnished or painted felt hats":—The hat is placed on a block and coated with the following composition; Whiting, (8 lbs.) or carbonate of lime is mixed into a paste with

2 quarts of hot water, and lampblack (½ lb.) previously mixed with ½ pint of water is added thereto. When the whole is well mixed, 1 quart of boiled linseed oil and 2 quarts of the caoutchouc solution are "thoroughly incorporated with the mixture by "stirring." The hat is then put into a drying stove, after which it is fit for japanning. The patentees describe a japan which they "prefer using."

4. Covering hats so as "to avoid the junction which is apparent when hats are finished by being covered in the ordinary "way with plush or other fabric:"—Knitted fabrics of silk or other substance are used. They are made somewhat smaller than the hat bodies and are "stretched tightly and smoothly thereon." The covering for the brim may be made separately from the other part or in one piece therewith. Sometimes the hat body is made of the knitted fabric; it is stretched on a block, treated with the before-named waterproofing solution, and thereby rendered waterproof and flexible. Sometimes the body only is made of knitted fabric, and the brim "after the ordinary method."

Other solutions, compositions, and varnishes may be used according to the degree of flexibility required.

[Printed, 4*d*. No Drawings. See Mechanics' Magazine, vol. 55, p. 195; Patent Journal, vol. 11, p. 255.]

A.D. 1851, September 11.—N° 13,743.

CROOK, John Rowland.—"Improvements in hats, caps, and "bonnets." The object of this invention is to make silk hats "lighter, softer, more elastic, and better ventilated than heretofore."

The foundation of the hat is made "of one single entire piece "without any seam or joining, and that piece of one thickness, "except at the edges and at other places where strengthening "pieces are introduced." Or the body is made of one piece of one thickness, and the crown and brim of separate pieces.

The material used for the body and brim is "palm leaf, or as "it is sometimes called Brazilian grass plait," but for the brim willow is preferable. The material is roughly plaited into the form of the hat, then soaked in boiling water, and then moulded into form on a block. To facilitate the moulding a small piece is cut out "from the centre or part corresponding with the centre "of the crown when the hat is made up," and the aperture is filled up "with a piece of scaleboard, millboard, calico, or other "suitable stiff but light material." The edges of the brim and crown have connected to them pieces of tape or strips of net or other binding material. The foundation is then varnished all over and covered with silk or cotton plush. The plait is rendered repellent of water by steeping it in some waterproof composition.

[Printed, 4*d.* No Drawings. See London Journal (*Newton's*), vol. 40 (*conjoined series*), p. 354; Mechanics' Magazine, vol. 56, p. 237.]

A.D. 1851, November 27.—N° 13,833.

ELLWOOD, Henry.—"Improvements in the manufacture of "hats." The body of the hat is "composed of two parts, leav-"ing a space or chamber between them." The space "may "either be closed or may have passages for air to enter and also "to pass away;" the latter arrangement is preferable. "The "exterior and interior form" may be varied, and the hat may be made of any material, care being taken to have it as light as may be.

[Printed, 6*d.* Drawing. See Repertory of Arts, vol. 20 (*enlarged series*), p. 23; Mechanics' Magazine, vol. 56, p. 458.]

A.D. 1852, February 12.—N° 13,968.

MOLLADY, John, junior.—"Improvements in machinery or "apparatus for manufacturing hats or caps." This invention relates especially to the manufacture of "soft felt rustic hats and "caps," although it may be used in shaping, rounding, and finishing hats and caps of other forms.

The apparatus required is composed of (1) horizontal framework supported by columns; (2) moulds hollow and serving as steam chests; (3) blocks attached to the lower ends of vertical sliding bars; (4) levers (weighted if required) for working the bars up and down. Steam is supplied to the moulds from a pipe connected to them by branches, and each mould is provided with a waste pipe. The blocks are kept heated by resting on the moulds.

The hat bodies are soaked in hot water "and made to fit the "block by hand in the usual manner, excepting that the brim is "not curled;" they are then dried and placed in the moulds. The blocks are lowered by means of the levers, and the bodies "are firmly pressed between the two heated surfaces." The brims are cut to the required width with a knife "which is run "round by hand" in a groove formed in each mould. The hats remain in the moulds for about a minute, "and after being "bound and lined are again pressed in the machine to give them "a final gloss."

[Printed, 10*d*. Drawing. See Mechanics' Magazine, vol. 57, p. 159.]

A.D. 1852, March 22.—N° 14,029.

BRADY, John Drumgoole.—"Improvements in helmets, "cartridge boxes, and other military accoutrements." The improvements in helmets consist (1) "in an improved form and "combination of materials;" (2) in arrangements for ventilation.

Four thin tubes of metal "unite at the crown" or are "carried "some short distance up and left open at top;" they are perforated "at the base and immediately above the head." This frame is covered with felt, stiffened, and formed into shape "with "openings corresponding with the lower openings of the tubes." The helmet is open at the top, where it is "furnished with some "ornamental device."

"For the ventilation of helmets and other head-pieces gene-"rally," two thin tubes of metal or gutta percha are placed on the inside "at the sides of and flush with the body;" air is admitted by leaving the tubes open at bottom and by perforating them or leaving them open at top. "Just above the head an "opening or openings must be made in the top of the helmet "for the escape of the heated air."

[Printed, 6*d*. Drawing. See Mechanics' Magazine, vol. 57, p. 277.]

A.D. 1852, May 1.—N° 14,106.

JOHNSON, James.—"Improvements in the manufacture of "hats." The improvements, namely, the introduction of whalebone into tarletan or like fabric, "the combination of whalebone "with leaves of cork or with cork dust," and the making of hat bodies with the usual fabrics, "but combined with cork dust," are described in the process of manufacture.

Threads of whalebone "about 9 inches long," and as thick as "ordinary sewing thread," are introduced into pieces of tarletan cut to "half the size of the side crown to be manufactured;" they are let in "in the direction of the height of the side crown "and a quarter or half an inch apart." The tarletan is then laid "on a cork leaf," keeping the whalebone between the two. " Water lac of the strength ordinarily used for gossamer hats, " dissolved with ammonia," and mixed with finely pulverized cork, is applied so as to "combine the cork leaf, whalebone, and " tarletan, in one fabric." The united fabric is pressed flat, a second coating is applied, and the whole is hot pressed. Two pieces are then cut "each to the required form for the block;" the portions which are to be overlapped are covered with thin lac, and when dry " are ready for closing with a moderately hot " iron." The side crown is steeped in tepid water for a few minutes before blocking. "The tip may be either of cork or " gossamer, or of gossamer and cork dust," and the whole is covered " with muslin and lac in the usual way."

The brim is made on a frame such as is used in making gossamer hats. The whalebone threads should be " a little stouter " than those used in the side crown," and "radiating from the " centre;" calico is stretched on the frame; then the prepared tarletan (with the whalebone between the two); then a heavy coating of the before-described mixture is applied; then another strip of calico and as much water lac "as it will hold." The brim when hot pressed is ready to be attached to the crown.

All parts of a gossamer hat are made in the usual manner, except that the water lac used is mixed with " finely pulverized " cork dust."

[Printed, 6*d*. Drawing. See Mechanics' Magazine, vol. 57, p. 416; and vol. 63, p. 55; Law Journal (*Exchequer*), vol. 24 (*new series*), pp. 23 and 305; Jurist, vol. 3 (*new series*), p. 21; Journal of Gas Lighting, vol. 2, p. 476; vol. 4, p. 152; vol. 5, p. 474; vol. 6, p. 226; Law Times, vol. 29, p. 163.]

A.D. 1852, May 22.—N° 14,132.

RUZÉ, Louis Victor.—" Improvements in the manufacture of " hat plush and similar silk cloths." The plush, &c. is "to be " passed through and to be acted on by a machine arranged with " teazles or cards on a cylinder, which lay the pile evenly."

The principal parts of the machine are (1) a cylinder on which frames of teazles or cards are fixed; (2) a perforated steaming box; (3) three rollers (in front of the cylinder) " which regulate " the manner in which the fabric is brought to be acted on by " the teazles or cards;" (4) three rollers (above the cylinder), two of which are pressure rollers; (5) a rotating brush "which " cleanses the teazles or cards;" (6) a "curved holder" (below the cylinder and brush) in which the fabric is placed. The gearing, &c. of the several parts is explained in the specification. The cylinder revolves at the rate of about 160 revolutions per minute.

The plush is first "subjected for about a quarter of an hour to " an acid bath composed by preference of five hundred parts by " weight of water to one of sulphuric acid, heated up to a mild " temperature." The moisture being extracted, the ends are fastened together so as to make an endless band, which is placed in the holder; thence it passes outside the lowest of the regulating rollers, between the upper two, over the cylinder, over the steaming box, over the nearest roller, and between the pressure rollers.

[Printed, 8*d*. Drawing. See Repertory of Arts, vol. 21 (*enlarged series*), p. 28; London Journal (*Newton's*), vol. 42 (*conjoined series*), p. 22; Mechanics' Magazine, vol. 57, p. 457.]

A.D. 1852, November 11.—N° 14,345.

FULTON, Andrew.—"Improvements in hats and other cover- ' ings for the head." This invention relates to "certain modifi- " cations of the linings and internal fittings" of hats, helmets, &c. "for the obtainment of an easy and pleasant fit" together with "superior coolness and more perfect ventilation."

The lining (which may be of the usual material) "is placed " within the hat so as to leave an annular space" all round between it and the hat body. The "inner edge" of the lining " is encircled by a light wire or whalebone ring," and the "outer " edge" by "a very fine whalebone ring." The upper ring " forms the sole means of communication between the lining and " the hat body, having attached to it at regular intervals asunder " four or more slips of thin metal or flat springs;" these are " hinged by suitable eyes" to the ring. The other end of each of the springs "is bent angularly" and "pointed so as to pene- " trate into the body of the hat, being held to the hat by stitchng " or pins."

"To give the lining the required elastic supports or bearings" a second set of plain flat springs is used; these are fastened at one end to the lower ring. All the springs are concealed between the lining and the hat body, "forming a species of barrier to pre- " vent absolutely contact between the two." To assist ventilation " *the lining may be* perforated with numerous minute apertures."

“Various other means, in addition to blade or other springs, “ may be adopted for the purpose of holding the loose free “ lining.”

[Printed, 8*d*. Drawing. See Mechanics' Magazine, vol. 58, p. 415; Practical Mechanics' Journal, vol. 5, 235.]

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1852.

A.D. 1852, October 1.—N° 14. (* *)

CHRISTY, THOMAS, junior.—“ Improvements in weaving hat “ plush and other piled fabrics.” “This invention has for its “ object improvements in that class of looms where two piled “ fabrics are woven at the same time, and are cut apart as woven, “ and consists of a combination of a frame fixed on the front of “ the reed, having two adjustable bars which control the distance “ at which the two fabrics are from each other, and consequently “ the length of pile in each fabric; such frame also having two “ other bars in front, which are adjustable, between which bars “ the carriage or plate of the knife moves. The knife has a “ curved cutting edge, and is fixed in a carriage which slides on “ a bar or rod, and is drawn from side to side by a cord acted on “ by a wheel moved in alternate directions. The knife in its “ movement to and fro comes against stones, and is sharpened “ and oiled. The use of jacquard apparatus is unnecessary, the “ harness being worked from below by treadles and levers;” these looms may be worked by hand or power.

[Printed, 10*d*. Drawing.]

A.D. 1852, October 1.—N° 61. (* *)

BAYLIS, JOHN.—(*Provisional protection only.*)—“ Improvements in hat-bands and armlets.” “Take a foundation (of or

" about the breadth of the intended band) of cloth or other suit-" able fabric, waterproofed or not, as required, and insert between " the two ends thereof a piece of caoutchouc of sufficient length " to allow of the amount of elasticity required. The crape or " areöphane is then fastened at one end to the foundation, while " the other end of the crape or areöphane overlaps that end so " fastened, and allows of the attached end sliding in or out of " the lap, according to the elongation or contraction of the foun-" dation. The lateral edges of the crape are turned down over " the edges of the foundation, and are fastened to it on the " inside by gum, cement, or stitching. Instead of caoutchouc, " any other spring might be used, but not with so beneficial " an effect."

[Printed, 4*d.* No Drawings.]

A,D. 1852, October 1.—N° 145.

NICOLL, Donald.—(*Provisional protection only.*)—" Improve-" ments in mourning bands for the arm or hat." These bands are to be used " chiefly for the purposes of complimentary mourn-" ing;" they have on them " distinguishing marks, forms, and " devices " stamped or embossed " either in relief or sunken letter " or figure."

The inventor does not claim any particular material, width, or mode of embossing, &c., but " the manufacture and use of hat or " arm bands having thereon devices, designs, or letters embossed, " stamped, or printed thereon."

[Printed, 6*d.* Drawing.]

A.D. 1852, October 2.—N 192.

PHILPS, George John.—" Improvements in hats and other " like coverings for the head." These hats, &c. are made " with " a seamless body and covering." The hat body is a seamless fabric, stiffened, and blocked into shape. The tip is formed of two or more thicknesses of calico, stiffened like the body and secured to it in the usual manner. The brim consists of one thickness of calico " known as swan's-down," stiffened and covered with two or more thicknesses of stiffened calico; it is secured to the body and varnished in the ordinary way.

" A perfectly ventilating hat body " is made by using a seam-*less open fabric* " with large spaces between the loops thereof;"

more than one thickness of fabric may be required for strength. Care must be taken in stiffening the body "not to fill the interstices with the stiffening composition." The body is covered with a seamless fabric, either a "looped fabric" or a "pile fabric." The sides, brim, and tip are covered from one piece of such fabric, and "it will be necessary to cut away a portion of that part of "the fabric intended to cover the tip and form the crown, so that "the part that remains may lie flat thereon." Sometimes the tip is covered with a separate piece of the same fabric. Sometimes the body is "covered with the plush ordinarily employed."

"A light and perfectly ventilating hat" is produced by covering the foundation of folding spring hats with a seamless fabric having either a looped or piled face.

[Printed, 4*d*. No Drawings.]

A.D. 1852, October 8.—N° 305. (* *)

TYLER, John Talbot.—"Improvements in hats, and in the "preparation of plush or other covering used in the manufacture "of hats." This invention consists (1) in coating with a solution of caoutchouc the "outer surface of the body of a hat," or the "inner surface or back of the plush or other covering for the "bodies of hats," or both, and after placing the body on a block causing the plush to adhere to it by means of a heated iron or other equivalent; (2) in preparing plush or other hat covering "by coating the back or inside thereof with the waterproof "composition."

[Printed, 4*d*. No Drawings.]

A.D. 1852, October 8.—N° 306.

TYLER, John Talbot.—(*Provisional protection only.*)—"Improvements in velouring machines, or machines used by hatters "for causing the covering of hats to adhere to the body, and for "polishing the nap of hats." The machine is adapted "to the "plank of every workman." The plank is made "to slide off "or lift up," and to a suitable frame under it is fixed a driving wheel connected by an endless band to a drum. The wheel carries a spindle for a crank handle, and the drum a spindle for the reception of a hat block. By turning the handle with the left hand "a rapid motion will be communicated to the block and

" hat placed on it, and the workman will have his right hand " free to use his velour."

Steam power may be employed where several machines are required to be set in motion. Or a treadle may be adapted to the purpose.

[Printed, 4*d*. No Drawings.]

A.D. 1852, October 9.—N° 314.

HUSBAND, Richard.—" Improvements in weaving hat plush " and other textile fabrics." Tne patentee claims as his invention " weaving or introducing the weft or shoot threads in a diagonal " direction " to the warp threads, in order that " when the piece " is cut straight across or at right angles to the warp threads, it " may possess a degree of elasticity and flexibility similar to that " obtained in a piece of ordinarily woven fabric by cutting the " same upon the bias or cross, or aslant the piece."

The annexed drawing represents a hand loom " for weaving " hat plush at an angle of about 27°." The slay is placed " at " an angle with the warp threads;" it is moved upon friction wheels running upon V-shaped rails. The " dents of the reed " are so placed as to be parallel with the warp threads. It is advisable, although not absolutely necessary, " that the healds or " harness should be placed at a corresponding angle " in order to " equalize the strain upon the warp threads and also to give a " more regular shed or opening of the same."

The method of weaving is precisely similar to the ordinary method, except that in consequence of the position of the slay and reed " the weft or short threads are necessarily introduced and " beaten up at a corresponding angle of inclination to the warp " threads."

The loom may be so arranged that " two cloths may be woven " at the same operation and afterwards separated ;" or a cloth may be woven " in a tubular form and cut into lengths as " required."

Some descriptions of cloth " may be woven by power."

[Printed, 6*d*. Drawing.]

A.D. 1852, October 23.—N° 508. (* *)

WHITE, William.—" An improved fabric suitable for ven" tilating hat bodies."

The patentee says,—" My invention consists in producing a " woven fabric by ordinary loom weaving from manilla grass; " both warp and weft are composed of such grass. I take care " to weave the fabric so open as to provide large interstices " between the threads. Of this material I form the bodies of " hats, and take care in stiffening the same not to fill up the " interstices or spaces between the threads, and thus a flexible " and ventilating hat body will be produced."

[Printed, 4*d*. No Drawings.]

A.D. 1852, October 28.—N° 551. (* *)

PROVOST, Henry.—(*Provisional protection only*).—" An im- " proved hat protector." The invention " consists in making " hat cases of a light woollen or other fabric, coated on one side " with india rubber dissolved in spirits of turpentine, so that the " material is rendered waterproof; the side of the hat cover not " coated with the india-rubber is placed so as to show exteriorly, " and imitate as closely as possible the appearance of the silk or " beaver of a hat. These hat covers or cases are slit at the side, " and are furnished with small hooks and eyes to keep the two " edges together." "The edge of the hat cover has a hem, " affording admittance to a narrow india-rubber band; this " band is fastened in several places on the hat cover. The india- " rubber band so contracts the opening of the hat cover that to " make the rim of the hat enter it must be stretched. The hat " cover or protector may thus be made to fit perfectly close."

[Printed, 4*d*. No Drawings.]

A.D. 1852, November 2.—N° 611.

SIEVIER, Robert William.—" Improvements applicable to " the manufacture of hats, caps, and bonnets, or other coverings " for the head." The material to be employed is wire " woven " or otherwise made into cloth, tissue, or fabric," and " used " either alone or in combination with other materials."

Men's hats or soldiers' caps :—The body is made " simply of " plain woven wire cloth;" this when cut out in the required form is pressed into shape; the jointed parts are soldered or otherwise fastened together; and it is then " covered or lined, or both, " with any suitable material."

Caps :—These being more round can easily be pressed into shape by dies, and the parts are then united by solder or otherwise.

Soldiers' and policemen's hats :—These or certain parts thereof may be made of stronger wire, or some other material may be introduced, "so that they may resist a heavy blow or a sabre "cut."

Ladies' caps or bonnets :—These are made of "a more ornamental fabric, such as is produced by either braiding, platting, "or plain or cross weaving, or manufactured into a fabric in the "same manner as pillow lace or bobbin net." The ornaments are made by cross weaving; flowers may be "made of a plain "wire fabric cut out in the form of leaves," &c. The ornaments so made are to be electrotyped or coloured or varnished.

Coiffures or ladies' head dresses :—These consist of "various "kinds of fabrics or tissues made of wire" with flowers, &c. added thereto.

Ribbons or braid :—"Very varied and pleasing effects may be "produced by employing wires of various colours in the same "way that silk or other threads of varied colours are now used."

[Printed, 4*d*. No Drawings.]

A.D. 1852, November 27.—N° 897. (* *)

HOUGHTON, George.—"Improvements in the manufacture "of college caps." This invention consists in "forming the edges "with vulcanized india-rubber or other elastic material, the cloth "or covering used being applied outside of such elastic material," and in "employing two or more thin sheets of wood cemented "together, the grain of the different sheets crossing each other, "to obtain the property of strengthening the upper part of the "cap, and keeping the whole in shape."

[Printed, 6*d*. Drawing.]

A.D. 1852, December 22.—N° 1129.

QUINCHEZ, Celestine Denis Veuve.—(*Provisional protection only.*)—"A new or improved fabric or texture which may "be used for making mantles, bonnets, and other articles of "female attire." The warp and woof consist "partly of ribbon "and partly of silk chenille of various colours;" they are arranged and combined in such manner that the fabric "shall

" present a checked appearance." The face will consist of "a " number of squares formed by the crossing of the different " materials arranged at suitable distances apart." The chenille " warp will appear on one side merely at the point of junction " where it is connected with the chenille weft," and the chenille weft on the other side "merely at the points where it binds in " the chenille warp." The ribbon warp and weft cross each other and are separated by the chenille.

[Printed, 4*d*. No Drawings.]

A.D. 1852, December 28.—N° 1175.

GIRAUD, Pierre François,—" An apparatus for the interior " of bonnets to fix them on the head." The apparatus is "a " light framing " made as follows :—" A circular metal spring " forms the support of the head piece or back of the bonnet; it is pierced "in the lower part of the circle" with a series of holes; on one end is a slide, and when the spring is extended to the required size, a pin " dropped into one of the holes " retains it in position. Two pins on the outer periphery of the spring "catch " up or slightly perforate the bonnet lining, so as to form a sort " of attachment or support thereby." Two branches are pinjointed to the spring, one on each side, " a little below the centre " of the circle;" they project horizontally, and are parallel to each other, "admitting the head of the wearer of the bonnet " between them." To the ends of the branches is pinjointed "a " steel elastic half or three quarter of a circle plate or spring " which " goes over the front part of the head and is adjustable to " its form." At each side of the plate, " about equidistant from " its connection with the branches " and its top, is pinjointed a short arm. At the outer ends of the plate and the short arms are holes by aid of which the plate and arms are sewed to the inside of the bonnet.

All the parts are made by preference of flat steel " similar in " breadth and thickness to watch springs," and as all the attachments " work swivel-wise," the apparatus " is capable of considerable modulation of form to suit various shaped heads before it " is fixed to the bonnet lining."

[Printed, 8*d*. Drawings.]

1853.

A.D. 1853, January 31.—N° 268.

CLARKSON, Thomas Charles.—(*Provisional protection only.*) —"Improvements in hats, caps, and bonnets, which improvements "are also applicable to other articles of wearing apparel." The inventor in the manufacture of these articles uses the "vegetable "material known as baste." He cements it, "in an unmanu- "factured state as imported," to a thin woven fabric by means of a solution of shellac or caoutchouc, cuts it into suitable sizes, and builds it up into hat, cap, or bonnet bodies. For this purpose he covers a block with a thin woven fabric, and cements thereto pieces of the prepared baste. When the whole has been ironed and pressed smooth, he takes out the block, and either removes the inner fabric or leaves it as an inside lining to the body.

Sometimes he attaches pieces of unprepared baste to the fabric on the block, and cements an outer covering of thin fabric to the base.

In applying the baste, he places it "with the fibres in that "direction in which the greatest stiffness is required;" in hat bodies "vertically."

He uses baste in the construction of hat, cap, and bonnet tips, by cementing to it one or more thicknesses of woven fabric.

In the formation of hat brims, he encloses an elastic webbing between two thicknesses of baste, and covers the whole with a thin fabric. To secure elasticity he makes "radial incisions" in all excepting the webbing on the inner circumference.

He employs baste combined with leather or other suitable material as a head lining "to prevent the passage of grease;" he also for this purpose cements a thickness of cork between the hat body and the head lining.

He makes linings for the tips and bodies of hats with baste ornamented by piercing or embossing; he recommends these linings for the purpose of ventilation.

Finally, he uses baste in an unmanufactured state as a stiffener for articles of male and female dress; it may be stitched or otherwise secured to the garment, or it may be previously cemented to a woven fabric.

[*Printed, 4d. No Drawings.*]

A.D. 1853, February 3.—N° 296.

DULAURIER, Benoit. — (*Provisional protection only*).—"A "new system to render boots and shoes waterproof without sewing "or nailing whatever; and the said invention to be applied also to "render waterproof hats, caps, and general hatting; my invention "consists also in the application of machines to the manufacturing "of general shoemaking and hatting." The inventor uses three compositions; the first of caoutchouc and gutta percha melted separately and then mixed together; the second of purified asphalte and marine glue; the third "of Monsieur de Coulène's "putty."

He briefly describes his method of treating boots and shoes; when on their trees or lasts "they are placed in their respective "screws only used for that purpose, and afterwards by means of "levers the uppers are strongly pressed on their trees or lasts "with the matrixes." When the nails are taken out, "the soles "are covered with glue," and "the complete finishing of the "adhesion of the uppers" is obtained by aid of other levers.

[Printed, 4*d*. No Drawings.]

A.D. 1853, February 5.—N° 317.

PEACOCK, Thomas.—"Improvements in weaving, and in machinery for weaving hat plush and other cut-piled fabrics." The first improvement "consists in a peculiar mode of arranging "the warp threads when such fabrics are woven double, and "afterwards separated by cutting the pile common to both "pieces," the object being to form the sheds "with less strain "upon the warp threads," so as to obtain "a more certain uniformity in the distance between the warps, and thus a more "uniform length of pile." The warp beams are placed "almost "close to each other;" they are "sustained in brackets screwed "on each side of the framing of the loom." One half of the threads from the upper beam pass under, and the other half over the first rod, and then each half respectively over and under the second rod, "forming one half of the warp of the upper and lower "pieces." The threads from the lower beam "pass in like "manner under and over the rods." Each thread "is passed "through its proper heald, and through the reed in the ordinary

" manner," then through the gauze "which regulates the length " of the pile," above and below the hollow rod in which the pile-cutter knife slides "partly round the taking-up roller, which is " covered with small sharp pins or spikes," and then "drops in " folds." The pile beam is suspended in bearings from the framing; the threads are divided into four parts; they descend from the beam under their respective rollers, and thence under a fifth roller "to the pile healds, and reed as usual." The axles of the four rollers "revolve in hooks or eye-holes," which are connected with spiral springs, so as to "keep the required amount " of tension on the threads, but give way to the motion of the " healds when the strain would be greater than the amount " required."

The second improvement consists in working the taking-up rolle by means of a bell crank, ratchet wheel, worm, and wheel, " all actuated by the levers and rods from the slay."

The third, in the apparatus for working the knife :—A vibrating arm moves a cord which passes over pulleys; being actuated by the feet of the weaver, it causes the cutter "to traverse across the " cloth, and cut the pile midway as the cloth advances and passes " over the cloth beam." The knife rubs against a whets one " each time it has passed across the loom."

The fourth is an arrangement "for giving a signal or for stopping " the loom when a warp thread breaks :"—Needles are hung upon the warp threads; when a thread breaks, a needle descends and brings into contact with the slay "a lever, which can be made " either to ring a bell or instantly arrest the moving of the " slay."

[Printed, 10*d*. Drawing.]

A.D. 1853, April 8.—N° 850.

FLANAGAN, Patrick Francis.—(*Provisional protection only.*) —"Improvements in the manufacture of hats for yachting and " general purposes." The body of the hat is of "Brazilian chip, " which is covered with calico and afterwards varnished or " japanned."

The novelty consists in "the varnishing or japanning of the " covers of such hats after they have been fitted to the body of " the hat."

[Printed, 4*d*. No Drawings.]

A.D. 1853, April 11.—N° 863.

GARRARD, Robert, and GARRARD, John.—(*Provisional protection only.*)—" Improvements in bonnets." These bonnets (which " are more particularly intended for the use of persons " exposed to the rain ") are made of "felt coated with japan or " varnish."

The claim is for the use of felt " in combination with japan or " varnish or other impermeable composition."

[Printed, 4*d*. No Drawings.]

A.D. 1853, April 14.—N° 906.

DUNCAN, John Wallace.—" Combination of gutta percha " with other materials, and the method of applying such for use." The ingredients of the cement which constitutes this invention are some of the following:— Gutta percha or gum madder, caoutchouc, shellac, Canada balsam, Venice turpentine, balsam " from the liquid amber styraciflua or styrax," gum mastic, oxide of lead, pitch, caseum, gluten, coagulated linseed oil, and gum ammoniacum.

A cement for uniting sheet gutta percha to leather, " as for " shoe soles," consists of fifty parts of gutta percha, 40 of Venice turpentine, 4 of shellac, 1 of caoutchouc, and 5 of styrax.

A cement for joining leather is composed of 60 parts of gutta percha, 10 of shellac, 2 of caoutchouc, 20 of Venice turpentine, and 8 of styrax.

To unite small particles of material, " such as leather shavings, " silk waste, hair, and the like," a cement is made from 20 parts of caseum, 15 of gluten, 5 of coagulated linseed oil, 1 of oxide of lead, 25 of Venice turpentine, and 34 of gutta percha; about 8 per cent. of gum ammoniacum may be substituted with advantage for " a like portion of the gluten."

" The above proportions may be varied."

In compounding the cements the balsams are heated " to the " requisite degree for dissolving the harder gums." The gums when dissolved " are then put into a machine with the gutta " percha, also heated, and the other component parts." The whole " is thoroughly amalgamated by mastication " and is expressed from the machine in a state suitable for use.

If caseum or gluten forms part of the cement, it is preferable " to combine such matters in the masticating machine with the

" balsams alone without heat," and then to introduce the gutta percha " in a heated plastic state."

In the annexed sheets of drawings are represented (1,) an apparatus for combining and masticating the compounds and for " applying the cements to the several substances required ;" (2,) a machine " for the manufacture of tubes or sheets of different " plastic materials ;" (3,) a machine " for manufacturing sheets " of plastic materials in laminæ ;" (4,) a machine, by which " the " cement may be applied to paper, sheet metal, or suitable textile " fabric, or other material, by uniting such in the form of round, " angular, or other formed tubes, which may be cut into lengths " for hat bodies, cases, boxes, and other articles."

[Printed, 1*s*. Drawings.]

A.D. 1853, May 6.—N° 1120.

FONTAINEMOREAU, PETER ARMAND le Comte de.—(*A communication.*) — " Improvements in the manufacture of hat " plush." The patentee combines " horsehair or other similar " tissues impregnated with gutta percha with silk or cotton plush, " for the manufacture of hats and other coverings for the head." " He employs a " loom for receiving the silk or cotton plush as " usual." He adds " a roller to form a warp of horsehair or " other similar fibre previously dipped in a solution of gutta " percha ;" this forms " an underneath tissue." He joins the two tissues together.

He makes a hat complete, except the lining, of the joined tissues, and asserts that such a hat can be folded with the greatest facility, whilst it has sufficient elasticity to resume its original shape.

He describes his process of hat making, but claims only the before-named combination of materials.

[Printed, 4*d*. No Drawings.]

A.D. 1853, May 13.—N° 1186.

BROOMAN, RICHARD ARCHIBALD. — (*A communication.*) — " Improvements in the manufacture of hats," namely, in " the " process of forming hat bodies, technically called sizeing or " planking."

The apparatus employed in the process is of the following *description* :—A trough to contain " hot water, which may be

" accidulated if need be," is provided inside with two rollers carrying an endless supporting band. On one end of each roller shaft is a ratchet wheel. A "hardener and shrinker," semicircular in shape upon its face, and broad enough to cover the endless band, is suspended over the trough, so that its face will press upon the band. The hardener is vibrated by an arm, which serves as a handle, and it carries "a pair of adjustable pawls," which "are fixed upon arms," and "extend to and play upon the " ratchet wheels." The pawls so work that at each vibration of the hardener the band carrying the hat body "shall progress a " little onward;" for this purpose one of the arms "must be " longer than the other," or "the centre pin holding the pawls " may play in a slot, so that it can be moved out or in, being " held in its proper place by a set screw." There is a feed board at each end of the trough, one for feeding in the hat bodies, the other for "drawing them off" as "they are lifted out finished."

The rollers "may be rotated from the outside," and if there are several apparatuses connected, "the hardeners may be driven " by power." Instead of immersing the hat bodies in a trough of hot liquid, "the work may be sprinkled from time to time."

[Printed, 8*d.* Drawings.]

A.D. 1853, May 25.—N° 1275. (* *)

BABB, WILLIAM.—"Improvements in the manufacture of hair " trimmings." The patentee proposes to use these trimmings in making men's hats.

The trimmings vary from one quarter of an inch to nine inches or thereabouts in breadth; they are made with a plain close surface, "the weft being of hair, or combined with other suitable " materials, and the warp formed of wire, glass, india-rubber, or " threads of silk, cotton, hemp, flax, wool, and like materials, " which, when desired, may be rendered waterproof by any of the " usual processes, and each may be used singly, or any two or " more in the warp." He finds it desirable generally, "that the " warp should be of waterproof material as well as the weft, the " latter, when composed of horse-hair or other hair, being repellent of water naturally;" he therefore uses "wire, wholly or in " part, in forming the warp, not only as resisting moisture, but " likewise to stiffen and strengthen the trimmings." But the entire use of wire is not essential, as "several well-known stiffening " and waterproofing materials may be advantageously employed,

" although never hitherto used for the purpose described." These trimmings may be made with either a plain or figured surface.

[Printed, 4*d*. No Drawings.]

A.D. 1853, May 25.—N° 1276.

BABB, William.—" Improvements in the manufacture of hats, " caps, and bonnets." The patentee uses "hair cloth or hair " trimmings " in the manufacture of these articles.

Sometimes he uses " the plain hair cloth in common use for " covering couches and chairs," and he prefers that it should be first " steeped in a suitable waterproofing mixture." In forming hats therewith the edges or joinings of the cloth are " wholly or " partly sewn or otherwise made to adhere by means of any suitable " stiffening;" or the cloth " may be stitched or sewn and then " cut into strips or trimmings and sewn together into the required " shapes." The hats are kept in shape by wire, whalebone, cane, or other framework.

In " fabricating hats, caps, or bonnets," he sometimes cuts the hair cloth into strips, stiffens the edges, presses them together (or not) " in imitation of trimmings," and then stitches them together.

He prefers however " in the manufacture of men's hats " to use his " improved hair trimmings, varying from one quarter to nine " inches or thereabouts in width, with a plain close surface and " of a black colour;" these he recommends to be sewn together " with waterproof or other thread after the manner customary in " stitching straw plait."

[Printed, 4*d*. No Drawings.]

A.D. 1853, May 28.—N° 1322.

HILL, Henry Charles.—(*Provisional protection only.*)—" Im" provements in machinery or apparatus for the manufacture of " hats, caps, and bonnets." The calico or fabric for the body is wound round a revolving spindle; it is carried thence between friction rollers to a " gripper machine " attached to a cylinder and either "revolving or stationary." The gripper carries the fabric " round or under the cylinder and a revolving brush, or between " two or more cylinders, through a prepared solution or liquid " gumlac or varnish." The solution flows through an aperture " formed through an horizontal bar fluted or a metallic pipe or

“ gutter;” it is contained in a metallic pan which may be heated by steam or hot air.

The saturated or coated fabric is carried by endless hands and friction rollers “ up to and round, over or under, and between ” blocks and cylinders, which are “ shaped and formed with the “ curve and taper ” required, and “ made in segments to take to “ pieces ” and capable of being “ reduced or enlarged ” and heated.

Sometimes instead of a cylinder there are used “ two metallic “ plates ” made in segments and shaped to the required curve; they move “ reverse to each other, or to and fro, on triangular “ bars.” The bottom plate “ is kept stationary by a lever motion “ when required to be used for covering and making the flock “ plush covering for the hats, &c.,;” it is brought to a stand-still under a “ bridge placed across the pan.” The bridge consists of two sliding plates and over them a wedge which “ moving up or “ down opens and shuts ” them. Under the bridge and wedge “ and carried or passed over the plates by friction rollers is a “ fibrous material to be used for the plush;” it is cut to the length required by moveable cutters and is pressed down on to the fabric; when set (which operation is facilitated by a rotary fan) it is “ gently brushed by a rotary brush and passed under a dressing “ and between two or more cylinders.”

The blocks “ are made to slide or screw ” on spindles “ after “ the manner of a chuck,” and the spindles have hinge joints which allow the blocks “ to turn up from the horizontal to a “ perpendicular position;” they revolve “ in the form of a double “ lathe head.” The spindles are “ attached to a turn-table,” and the crown and brim of the hat are “ lifted or forced on ” by a machine “ fixed over and attached to the framework of the turn- “ table,” when the blocks have received the first layer of fabric.

The hat undergoes a very similar process to that already described to receive the second layer of fabric; it is then “ passed “ round under a shaping machine which is attached to the frame- “ work ” of the apparatus, and then round under a “ flocking “ machine,” which with its effects is fully described in the Specification.

“ In the last stage or part for finishing the hat is placed a “ punching machine ” for perforating the hat. When the blocks are taken off their spindles, they are put on to “ a revolving spindle “ attached to a large circular plate or fly wheel ” with a number of projecting arms, and the hats are then "further finished by " having a gloss put on by means of heated rollers, &c."

Full particulars of the apparatus and of the process of manufacture are given in the Specification.

[Printed, 6*d*. No Drawings.]

A.D. 1853, July 7.—N° 1623. (* *)

STUART, John Knox.—"Improvements in hats and other " coverings for the head." In hats constructed according to this invention "perfect ventilation" is secured.

"The main body of the hat is constructed in the ordinary manner, " except that the upper part is removed, or the crown left off." A crown piece of slightly larger diameter than the body fits loosely on to the top of the body "so as to leave a narrow annular space " all round between the contiguous junction surfaces;" it is supported thereon "by pins or other holding pieces." The rims are stiffened by wire "wound round the interior surfaces," and "slide " pieces may be fixed to allow the separate cover or crown piece " to slide up and down." The ventilation may be further increased by perforations in the upper portion of the body which is under the fillet of the crown.

The upper portion of the body may be made "so as to form a " narrow annular step," in which case the crown will be of the same dimensions as the body.

The crown may be secured to the body "by small screw staples" held by brackets in the sides of the body.

Caps and helmets may be made on a similar principle.

[Printed, 6*d*. Drawing.]

A.D. 1853, July 26.—N° 1762.

HOPKINS, Lansing E.—"The manufacture of hat bodies of " fur and other like substances." The bodies are hardened "on " an exhausted cone," without "wetting them with water before " they are taken from the cone," by means of the following apparatus and method:—

The ordinary endless feed apron, rollers, and cylinder "called a " picker," are "well understood." Below the picker is an inclosed air chamber communicating by a pipe with an exhausting fan, which forces a current of air past the picker and thereby drives the fur forward towards the cone. An additional supply of air may be obtained by placing fans at the sides of the picker. On the side of the cone opposite to that on which the fur is received are conical rollers which press against the surface of the cone and turn as the cone revolves; and "on the curved part of the tip are " several small rollers" which adapt themselves to the curve and press down the fur as it is laid on the cone. "The rollers should " have also an end movement" to "facilitate the interlocking and " hardening the body." A pipe, slit its whole length and curved to the section of the cone, and having the slit covered with cloth, lets "a slight breath of steam out upon the fur." The pipe "is " small and wound with cloth, and then a casing also having a " slit in it is put over the cloth to cover it." The pipe and the rollers are jointed, so that they can be thrown back from the cone. Before the cone is used it is fitted with a cover of thin cloth "which " comes off with the body when made and is then easily removed " from it."

"Instead of making the conductor as above described" it may be made in two parts, "curving them around so as to have their " openings opposite each other, or nearly so, and then placing the " cone between them;" the whole of this arrangement is described in the Specification.

[Printed, 6*d*. Drawing.]

A.D. 1853, August 24.—Nº 1973.

SWONNELL, ALFRED.—"An improved construction of tie for " neckcloths and neck ribbons, applicable also to neck ribbons of " caps and bonnets." The tie is composed of three pieces of fabric, a barrel or central part of a bow, and an elastic cord or hook and eye for securing the tie.

The middle piece "has its longitudinal seam inwards;" the end pieces (which are sewn to the middle piece) have their longitudinal seams on the opposite side. One end piece is folded back and fastened to the barrel; the other is also folded back, passed through the barrel, and secured by a hook or a button (on one end of the middle part) and a loop on the moveable end part.

A complete "permanent bow" may be formed by one end piece, and the other end piece may be passed into the barrel and there secured as before.

For "long end cravats" the end pieces are passed through the band, one being fixed thereto, the other secured as before. The patentee also applies to the cravat "an elastic or other fastening "for preventing it from shifting its position or becoming loose "on the wearer's neck."

As the mode of applying the invention to ribbons of caps and bonnets "must be evident, no further explanation will be necessary."

[Printed, 6*d*. Drawing.]

A.D. 1853, November 10.—N° 2602.

PIDDING, William.—(*Provisional protection only.*)—"Improvements in the manufacture of fabrics made of silk, cotton, "wool, flax, hemp, straw, grasses, fibres, mohair and other hair, "spun glass, and enamelled, glazed, or plain wire, and in the "application of some of those materials, and also in the machinery or apparatus connected with such manufacture." The inventor makes a loose fabric for bonnets and similar articles from mohair or straw and india-rubber or gutta percha or a compound of the two.

1. He stretches a sheet of india-rubber or gutta percha, causes the mohair or straw to adhere to one surface, presses the whole between cylinders, and forms the loops by the contraction of the rubber.

2. He attaches the mohair to both sides of the stretched rubber, rolls the whole round a cylinder, causes it to pass between other two cylinders, cuts or splits the rubber as it passes between the cylinders by means of a knife which moves backwards and forwards, and rolls the cut parts on to two rollers. He thus produces two fabrics which become looped by the contraction of the rubber.

After the contraction he sometimes removes the rubber and substitutes "a more appropriate material by adhesion."

[Printed, 4*d*. Woodcut.]

A.D. 1853, November 16.—N° 2659.

JACKSON, Thomas.—(*Provisional protection only.*)—"Improvements in the manufacture of hats." The improvement consists in applying the fabric of which the nap is composed, so that "in place of inclining around the body of the hat" it may "incline vertically or nearly so, that is from the crown towards "the rim."

[*Printed*, 4*d*. No Drawings.]

A.D. 1853, December 13.—N° 2888. (* *)

REDGRAVE, William.—"The improved safety travelling cap" consists of "one, two, or three, or any number, at the option of "the wearer, of air-tight circular tubes to be inflated when "required for use, or contrariwise when not wanted, and to be "made of any materials, as silks, satins, velvets, alpacas, woollen "cloths, &c., or in fact of any material that is manufactured or "known, and can be made into any shape; it combines both "safety, ease and comfort to the wearer."

[Printed, 4*d*. No Drawings.]

A.D. 1853, December 16.—N° 2920. (* *)

WHITEHEAD, Walter George.—(*Provisional protection only.*)—"An improvement or improvements in hats, caps, bonnets, "and other coverings for the head."

This invention consists in the introduction into coverings for the head, "of such combinations of metals or materials as shall "form with the moist skin during the wearing" of the said coverings, "a voltaic or galvanic combination and develope a cur- "rent of electricity; the electrical current so developed curing "or relieving headache, or other nervous or painful affections in "the head of the wearer."

Parallel wires of copper and zinc may be placed around the interior of the covering; or plates of copper and zinc may be introduced "in such parts of the said covering as during wear comes "in contact with the head."

[Printed, 4*d*. No Drawings.]

1854.

A.D. 1854, January 9.—N° 48.

HUSBAND, Richard.—"Improvements in the method of ven- "tilating hats or other coverings for the head." Between the inner side of the hat and its ordinary lining, or outside this lining, is placed a secondary lining, so as to be in contact with the head and preferably at the portion worn to the front. This secondary lining extends either a part way round the hat from the rim or lower part towards the crown or upper part or round the whole.

It is detached from the principal one, except where fastened at its extremities. Its lower edge may be stiffened with whalebone or otherwise. This arrangement allows a current of air to pass through the intermediate space thus formed between the principal and secondary linings and thence upwards inside the hat, passing out at apertures in the crown or elsewhere.

[Printed, 6*d*. Drawing.]

A.D. 1854, February 13.—N° 351.

SMITH, JOHN BURT, and SMITH, EDWARD.—"Improve-" ments in bonnets." These bonnets are so constructed that they are "capable of being laid flat in a box."

1. "Drawn silk bonnets and bonnets in which the back or " crown thereof is made of silk or other similarly flexible mate-" rials:"—The front and the crown are connected by sewing " along or near the edges." The crown and the curtain are made each in two parts, and these are connected by loops, buttons, and strings; the curtain is connected to the front in a similar manner. Or the parts of the curtain may be united by a piece of elastic tubing on the one part, and on the other a small piece of whalebone which enters the tube; strings tied together keep the tube and whalebone firmly together.

2. "Leghorn, chip, straw, Tuscan, felt, beaver" bonnets:—The front is made in two parts, a front and a back portion; these are connected by pieces of elastic on the inner side. The crown is made in one part and is attached to the front by pieces of elastic " which are hidden by the head lining." The divided parts are brought into proper position for use by elastic tubing sewn "along " the bottom edge and on the inner side" of the hinder front portion and by strings which pass through the tubing and through a short piece of tubing attached to the lower edge of the crown; there is a hole made in the short piece for the exit of the strings.

The patentees make the foundations of their bonnets of whalebone or cane, separately or combined, and sometimes dispose trimming "over the points of junction" of the divided parts.

[Printed, 10*d*. Drawing.]

A.D. 1854, March 3.—N° 520.

SPILL, GEORGE.—(*Provisional protection only.*)—"Improve-" ments in the application of waterproof hat bands to the manu-

" facture of hats." This hat is called by the inventor the " adiantum hat." A hat band, rendered waterproof by any suitable composition, is fixed to the hat "immovably" so as to " secure the junction of the felts of the hat body and hat brim " from the moisture which is liable to penetrate through."

The inventor constructs the hat in such manner "that the felt " on the hat brim may extend a little way over the hat body, " while the felt of the hat body may terminate at or near the " same line." The edges of both will be covered by the middle of the band.

[Printed, 4*d*. No Drawings.]

A.D. 1854, March 4.—N° 532.

STUART, John Knox.—(*Letters Patent void for want of Final Specification.*)—" Improvements in hats and other coverings for " the head," so that "perfect ventilation" may be secured whilst " easy and comfortable fitting is also attained."

Tubes or folds of horsehair, india-rubber, or other elastic substance, are attached to the interior of the hat body, by preference " so as to run in lines parallel to the axis of the hat;" they are covered over with a lining piece of " hair-cloth or other permeable " fabric."

Or " a species of double hat is used;" the brim and lower portion are made double, "inclosing an air space, access to which is " gained by perforations through the brim, edge, or other por- " tion." Air can thus "pass in through the thickness of the " brim and issue up between the two walls of the hat body." The inner portion of the body may be carried up " nearly to the " top with lateral perforations or only a short distance up." Tubes (one or more) are passed up through the ventilating space " open- " ing at one end to the external air through or near the brim and " at the other through the hat body towards the top."

Instead of elastic tubes "an easy fitting surface is obtainable " by curled hair or other padding suitably held in position."

The ventilating hat already patented by Mr. Stuart (A.D. 1853, July 7th, No. 1623) is modified "by so arranging it that the " external portion shall descend down or nearly to the level of " the brim."

[Printed, 4*d*. No Drawings.]

A.D. 1854, March 8.—Nº 550.

BEARDSLEY, George.—" Improvements in round or circular " machinery for the manufacture of textile and looped fabrics." Among the articles which may be produced by aid of these improvements are " fleeced, plain, textile, or looped fabrics to be " used as glove linings, cloak linings, and to cover cork soles, &c., " and fleeced, plaited, looped, or textile fabrics, having a silk, " cotton, or worsted back, or the reverse, or both sides fleeced, " one cotton or silk and the other worsted, to be used for lining " under garments, making up into hats, bonnets, gloves, chest " protectors, &c. &c."

The invention consists (1) in the addition of " a looped presser " wheel " for the purpose of " throwing in a loose loop into the " fabric over every other needle or otherwise if required ;" and in the addition of " two extra wheels connected with the main " wheel for making the fabric, so as to throw a loose or fast loop " on either side of the fabric for the purpose of raising and carding " it in order to form a fleecy surface of various lengths of fleece ;" (2) in making the fabric " by having every other needle a blank " or a point so as to produce an additional loop, thereby creating " an increase of fleece."

The presser loop wheel " has a bit or point of iron, brass, or " other suitable material, introduced between every other tooth " or otherwise for the purpose of pressing off the loops from every " other needle or otherwise at pleasure." This wheel and an extra thread carrier are used " for causing loose loops to be left " on one side of the fabric for the purpose of being made into a " fleecy surface." If both sides are to be fleeced, two such wheels and thread carriers must be used.

The specification contains a full description of the machinery.

[Printed, 10*d*. Drawing.]

A.D. 1854, March 30.—Nº 725. (* *)

LUCEVILLIARD, Jean François.—" Improvements in fast" ening or sustaining to the body the various parts or objects of " body clothing, equipment and harnessing." This mode of fastening or sustaining, which is applicable to pantaloons, drawers, skirts, petticoats, socks, stockings, and night caps, consists of " elastic bands frilled at one or both edges."

The frill is produced by forming the warp of the loom partly of threads of caoutchouc "in a stretched or extended state when " in the loom;" on removing the band the threads contract, and the upper or lower part (or both) " becomes frilled or plaited."

If the band is produced in "an ordinary circular loom or knit- " ting frame," the caoutchouc thread is wound on a reel "carried " by a suitable frame mounted on the machine," and it is passed between toothed rollers or wheels, "which are driven by the " machine so as to supply the caoutchouc thread at the proper " rate."

The band is sewn to the article of clothing by the frill, unless the article is a looped or knitted fabric; in this case a frill is not necessary, "as the fabric itself supplies its place." Caoutchouc threads are introduced into the fabric during its manufacture, " so that the elastic band, frilled edge, and article of clothing, " are all made in one piece."

The patentee describes his method of weaving the bands and a portion of a circular loom or knitting frame whereto is added the apparatus for introducing caoutchouc threads.

[Printed, 8*d*. Drawing.]

A.D. 1854, April 11.—N° 842. (* *)

BROOMAN, Richard Archibald.—(*A communication.*)— " Improvements in the manufacture of hats." This invention relates to forming "felt cloth hats, so that they will afterwards " maintain their shape and stiffness under all circumstances of " ordinary wear, by introducing gutta percha, either pure or in " some of its combinations, between two sheets of felt cloth, and " afterwards forming the said sheets into a hat by pressure in a " mould, while the gutta percha is in a plastic state."

[Printed, 4*d*. No Drawings.]

A.D. 1854, April 15.—N° 873.

LAWES, Thomas. — (*A communication.*)—"Improvements in " protectors for the head." The protector is a cap intended to protect a child's head and face from the effects of a fall or blow.

The body of the cap is made with the middle portion "of a " much larger diameter than the upper and lower parts" and consequently projecting beyond them. A lower rim fits the head, an upper one forms a crown. The lining is made with a "string case to regulate the size." Bands forming the upper part of the cap terminate in a button. The body may be made of cane, straw, or other material, and the whole may be lined, covered, and ornamented. It is recommended that the lower rim be "interlined with wadding or other padding."

[Printed, 6*d*. Drawing.]

A.D. 1854, May 3.—N° 997.

KNAPP, William Hyde.—(*Letters Patent void for want of Final Specification.*)—"Improvements in the manufacture of hats "and bonnets." The inventor makes imitation napless hats and bonnets. For hats he cements and flocks the surfaces of "soft "felted bodies, or hat bodies such as are used or as are suitable "for being covered with silk." For bonnets he uses "stiffened "bodies made of woven fabric" and applies cement and flock to their surfaces.

[Printed, 4*d*. No Drawings.]

A.D. 1854, May 23.—N° 1146.

WHITE, William.—"Improvements in hats and in hat "blocks." The hat body is formed with indentations or internal raised surfaces, perforated for the passage of air; it is afterwards covered with silk or other covering; or the outside of the indentations is covered with the same material as that of which the body itself is formed, and then with silk. In making a hat body of this description, grooves are formed of any required section and depth in the hat block, and "the foundation of the body" is then pressed in; in some cases there is previously placed inside the foundation next to the block a piece of galvanized or metallized paper, silk, or cloth, "to form an ornament to the raised surface "inside" and to render the hat impervious to grease. A cover is then put on the outside of the indentation and afterwards the final covering; or the final covering is only so put on that the part of the hat body which has been pulled into the groove "will form "a hollow space between the body and the covering, perceptible "only on the inside of the hat." The raised part of the hat body inside, the cover to the indentation (when such is employed), and also the crown of the hat are all perforated.

Or the hat body may be made in the ordinary way, and a separate indented piece may be fixed to the inside. The part of the body opposite the indented piece is perforated with holes, corresponding or not with those in the indented piece. This plan is shewn in the drawing.

[Printed, *6d.* Drawing.]

A.D. 1854, June 7.—N° 1260.

NEWTON, William Edward. — (*A communication.*) — " An " improved manufacture of bonnets and other coverings for the " head." The articles are " made principally of leather, paper, " or cardboard, covered with some textile material, such as silk, " satin, or batiste." The leather, &c. is cut to the proper shape and ornamented by cutting or perforating, stitching, blind-tooling, embossing, gilding, or other means. The pieces thus prepared are stitched or otherwise fastened together into the required shape by a light wire framing. A lining of suitable fabric being put in and strings, ribbons, and other ornaments being added, the article is complete.

"The improved manufacture may also be applied to caps and " other coverings for the head."

[Printed, *6d.* Drawing.]

A.D. 1854, June 16.—N° 1312.

MACNEE, James, junior.—(*Provisional protection only.*)—" Im- " provements in caps, hats, and other coverings for the head." These caps, &c. are so constructed " as to render them capable of " being packed in a very small compass, whilst they are also " elastic, or capable of expanding to fit the head of the wearer, " and are provided with arrangements for ventilating the " interior."

In caps " the pan or internal form or frame " is a " band or strip " of elastic or other material which is attached to top and bottom ;" sometimes " intermediate spring wires, ribs, or narrow strips of " metal or other suitable material " are used. The ends of the band " are brought together," and the wires or springs " form " themselves into rings, their ends being arranged to slide over each other " so as to make the frame larger or smaller." The frame is separate from the outer covering, and " the ends being

" disconnected, it can be rolled up in a very small compass, " whilst it forms a stiff frame when put together for wear." The outer covering may be of any material which can be easily folded up; when required it is passed over the frame and secured in any convenient manner; or it may be elastic and fit tightly to the frame.

Ventilation is obtained by "forming holes in the sides of the " pan," and in the covering " holes corresponding to the sides of " the head only." The holes in the covering are made ornamental, and they may be covered "with gauze or ornamental " work of any kind."

" The same general arrangements are applicable to hats, " bonnets, and other coverings for the head."

[Printed, 4*d*. No Drawings.]

A.D. 1854, June 20.—N° 1351.

CHITTENDEN, George R.—(*A communication.*)—"Improve- " ments in sewing machines." One improvement is the addition of an instrument for folding "bindings for the edges of hats and " other articles and for "holding such bindings correctly during " the action of the sewing machine." The instrument " consists " of two bent plates with a space between them for the passage " of the binding, which is caused to lap more or less on one side " than the other, or is folded equally on either side of the edge " of the article to be bound by means of adjusting slides which " control the binding and guide it up to the point where the " sewing is accomplished." The slides have " flexible edges " of leather or other suitable material; they are each governed by " two parallel links " which are pinjointed to their respective slides and to the bent plates. As the edge of the article is introduced into the space between the plates, "the binding fabric will " be folded over the edge and at the point where the needle " passes through the edge;" the binding " will be held correctly " for the passage of the needle;" and as the edge is moved up to the point, it will draw with it the binding fabric, which "will be " progressively folded."

Another improvement relates to an " apparatus for holding " and regulating the letting off of thread." The thread is caused to pass between two surfaces, one of which is pressed to the other by a spring "in such manner that the thread only passes when " the pressing surfaces are separated." The separation is caused " by the action of the apparatus which gives motion to the " needle, so that for each action of the needle a quantity of the " thread is allowed to pass."

[Printed, 1*s.* 4*d.* Drawings.]

A.D. 1854, July 18.—N° 1574.

HILL, MARY CAROLINE.—(*Provisional protection only*)—" An " improvement in bonnets and in bonnet frames." The improvement in bonnets " applies to all such as are made of silk, " velvet, or textile fabrics generally." The bonnet is so constructed that by means of a sliding frame it will form " either a " small bonnet barely covering the face or a large bonnet which " will effectually protect the face."

The parts of the frame " which run from back to front " are made in two or more pieces " made to slide one within the other " or to slide side by side."

[Printed, 4*d.* No Drawings.]

A.D. 1854, July 21.—N° 1610.

STEVENS, MARY ANN.—(*Provisional protection only.*)—" Improvements in bonnets." The improvement consists in applying hoods or shades to bonnets in such manner that " they may " be made to recede within the bonnets or shut up to the edge or " front of the bonnets."

The hood is made with a frame corresponding in form with the front of the bonnet. The fabric of the hood is " made up on a " frame so as to retain its form and move back into the interior " of the bonnet on the wires or frame of the bonnet ;" or it is made " to pucker or go into small folds on the wire or frame of " the bonnet and lie within the front." The hood is held in position " by springs or suitable instruments."

" Sun shades are fastened on over the fronts of bonnets as " heretofore."

[Printed, 4*d.* No Drawings.]

A.D. 1854, August 9.—N° 1749.

HACKETT, JOHN.—" Improvements in the manufacture of " garments, or parts of garments, or of appendages or appliances " to garments." The patentee employs leather cloth or artificial leather in the manufacture of gaiters, overalls, gloves, mittens, caps, hats, braces, belts, garters, button coverings, and "articles " of a similar character."

[Printed, 4*d*. No Drawings.]

A.D. 1854, August 17.—N° 1795.

COWPER, Charles.—(*A communication.*)—"Improvements in " the felting of hats, and in the machinery for that purpose." The following are the principal parts of the machinery and their arrangements:—An upper and a lower series of rollers revolving in opposite directions are mounted on frames, each of which is supported on four pillars; the upper rollers "are placed over the " spaces between the lower rollers" so as "to increase the number " of points of contact." The rollers have not only "a con- " tinuous rotary motion more or less rapid communicated from " one to another by a series of spur wheels and pinions" or " by worm wheels and endless screws," but they have also "a " reciprocating rectilinear motion in the direction of their length, " which motion is always in the contrary direction in one series " to that in the other." The rectilinear motion is obtained by connecting the roller frames to "double levers" which are worked by connecting rods jointed to adjustable cranks or pins on the driving shaft. The frames are guided by pillars or guides at each end of the machine. The upper frame is pressed downwards by adjustable weights or by springs. A hot water bath is so arranged " that the lower rollers may dip into it, and a cistern with a perforated bottom and placed over the upper rollers " serves to " distribute a shower of hot water upon them." The water is raised from the bath to the cistern by means of a pump.

The hat body is presented to the first pair of rollers, whence it passes successively between the others and out of the machine, having been submitted during its passage to heat and moisture.

" It is convenient to employ two of these machines placed side " by side, but in contrary directions," so that the body on leaving the first may be immediately put into the front of the second.

In order "to obtain a greater thickness at those parts which " are to form the rim of the hat than at the apex of the cone " which forms the crown," the apex "is folded over" before the body is put into the machine, "and this part is therefore exposed to " greater pressure and is caused to become thinner than the other " part." The body is passed several times through the machine, " and each time it is unfolded on a table and again folded in a

" different part so as to prevent the formation of permanent folds " or creases." The connection of the several parts of the machine and the arrangement for facilitating the introduction, withdrawal, and adjustment of the bath are explained in the specification.

[Printed, 1*s.* 4*d.* Drawings.]

A.D. 1854, August 18.—N° 1820. (* *)

JOHNSON, William.—(*A communication.*)—(*Letters patent void for want of Final Specification.*)—" Improvements in the " manufacture of hat bodies." This invention relates to applying and using "hard rubber" in the manufacture of hat bodies. The material, when soft, is moulded to the shape required and vulcanized on the mould. The compound preferred is made up of two pounds of rubber to one pound of sulphur. " Sulphurized " gutta percha may also be used for a similar purpose."

[Printed, 4*d.* No Drawings.]

A.D. 1854, September 1.—N° 1913.

LINDHEIM, Marie Louise.—(*Provisional protection only.*)—" Improvements in the manufacture of bonnets or caps." These articles are so constructed that they " may be packed up in a small " compass." The frame is made of wires radiating from the " central portion or crown," and these wires " are crossed by other " wires of a curved or circular form, which are provided with " hinges at intervals." The hinges " allow the two sides or the " top and bottom of the bonnet or cap being brought together." When the bonnet is opened out, it is kept so " by a catch attached " to one of the hinges;" the catch " being slipped into its place" prevents the hinge from bending. Vulcanized caoutchouc or other flexible and elastic substances may be employed instead of springs, " so as to admit of the frame folding at the required " parts." The frame is covered and ornamented as may be desired.

[Printed, 4*d.* No Drawings.]

A.D. 1854, September 5.—N° 1940.

STOCKER, Samuel.—" Coverings for various parts of the " human body with a view to the preservation of health." The covering first described is one for the mouth and teeth denominated by the patentee a lungs' protector.

The second is a head covering intended "to protect the eyes:"—it is formed "as a hat or cap of any desired shape" with one or two apertures in front just above the brim and "fitted with "screens of glass, wire gauze or other suitable material." An elastic band may be attached to draw down over the apertures and hide them "when the hat is worn in the ordinary position."

The third is a head covering for the same purpose:—it consists of a hat "having the body made in two parts." The upper part "rests upon the head;" the lower part (which carries the brim) slides over or within the upper; it is provided with apertures and screens as before mentioned. An elastic water-tight band connects the parts, and the upper part is supported on the head by a strap or by drawing in the lining.

The fourth is a head covering for protecting "the face and the "back part of the head:"—it consists of a hat having within it a padded ring or hoop supported by stays. Between the body and the ring is an annular space, in which is "a moveable screen "having a portion of the front removed and the space covered "with wire gauze or other suitable material."

Sometimes this covering is made in the shape of a cap or helmet having a veil attached to the rim. The veil is provided with apertures and screens for the eyes, nose, and mouth; when not required it is rolled or turned up round the lower part of the cap. There may be attached to the cap an air-tight hollow band, which when inflated will serve as a pillow.

The fifth is a hood for protecting the head and shoulders:—it is made with an aperture for seeing through, and the aperture is covered with gauze; it is worn over the hat or bonnet and may be drawn in at the neck with a running string.

The sixth is a foot covering:—Waterproof shoes have the upper part perforated, and "worsted or other suitable threads or strips "of list" or other fabric are inserted into the perforations. Clogs have "the external and upper part" made of "paper made im-"pervious to the wet," and the "heel piece and subsole" of wood or leather.

[Printed, 8*d*. Drawing.]

A.D. 1854, September 9.—N° 1972.

BOWLER, WILLIAM.—(*Provisional protection only.*)—"Im-"provements in hats and other coverings for the head." With outlet apertures for the air at the top of the hat is combined a means of admitting air between the hat leather and the inside of the hat body. The leather has a series of air holes "formed " completely round and just within its lower edge." Pieces of felt or cloth are placed at intervals round the hat between the leather and the inside, to cause the leather to stand off from the body and allow the passage of air to the interior. The pieces may be fixed either to the body or to the leather; they prevent "the " hard body of the hat from touching the head."

[Printed, 4*d*. No Drawings.]

A.D. 1854, September 12.—N° 1983.

GILLMAN, Edward.—" Obtaining filaments from certain " vegetable substances and applying the same to various manu- " facturing purposes." These filaments are obtained from the fibrous portions of the leaves of certain plants which are indigenous in New Zealand, namely, "a running climbing plant called " giagia in the language of the country and a species of dracaena " called ti." The filaments, either alone or in conjunction with filaments from the phormium tenax and others employed in spinning or weaving, are applicable to a variety of manufacturing purposes, among which are mentioned "a kind of velvet or " shag" for covering hats, caps, and bonnets, velveteen for shooting coats and vests, and a fabric for shirtings and for shawls.

The leaves having been thoroughly dried are "stamped, " pounded, bruised, or milled," and afterwards macerated in soft water, until the cuticle is "entirely cleared away." The process may be facilitated by boiling or steaming the triturated leaves "in " a solution of soda or other alkaline substance;" if the solution injures the fibre, its effect may be neutralized "by the agency of " an acid." After the fibrous portion has been decorticated, it will be in a fit state "to work up into the coarser sorts of fabric," but for finer fabrics "it will first require to be thoroughly " bleached."

[Printed, 4*d*. No Drawings.]

A.D. 1854, September 21.—N° 2040.

MONEYMENT, Matthew.—(*Provisional protection only.*)— " Improvements in hat, bonnet, and other boxes." These boxes are made of " scaleboard, veneer-board, paper, or pasteboard;" the invention consists in rendering them waterproof by coating the outside, or outside and inside, with elastic japan varnish or any other suitable waterproof varnish. The inventor prefers to waterproof the boxes when complete, but the sheets may be waterproofed and then made into boxes. He strengthens the boxes by making them double or by attaching pieces of scaleboard or other substance to such parts as require strength.

[Printed, 4*d*. No Drawings.]

A.D. 1854, September 28.—N° 2087. (* *)

CRUX, George.—The patentee says:—"My invention relates " to bonnets, or similar coverings for the head, made of woven " fabrics, and consists,—

"Firstly, in producing the outline of the article during the " production of the fabric. To this end I use a loom so arranged " as to manufacture a 'quilted' or 'toilet' fabric, and I so regu- " late the movement of the threads that the required shape is " defined ready to be cut out and made up.

"Secondly, in a method of producing devices upon fabrics " intended for bonnets, &c., which are effected by hand stitching. " To this end I employ a loom as now used for the production of " 'quiltings,' toilet covers, &c., and effect thereby the weaving of " raised stripes and other devices; and in order to obtain a smooth " back to the fabric I use three sets of warps, one of them being " employed for that purpose. These several points may be com- " bined for the production of one article."

[Printed, 6*d*. Drawing.]

A.D. 1854, September 29.—N° 2096. (* *)

JOHNSON, John Henry.—(*A communication from Paul Désiré Chaumont.*)—(*Provisional protection only.*)—"Improvements in " machinery for removing the points from the hairs of rabbit and " other skins employed in the manufacture of hats and similar " articles." This invention relates to the cutting or plucking off of the hard points or extremities of the hair on rabbit and other skins, so as to leave merely the soft downy fur on the skin. This is effected "by the aid of a series of nippers composed " of bars or blades of metal, arranged to work in a frame by " the action of a crank connecting rod." The skin to be operated upon is carried on a drum underneath the nippers,

" and as it passes along, the nippers lay hold of the extremity " of the hairs and remove them." In order that the action shall be as nearly as possible analogous with the action of the thumb and forefinger, "one of the nipping blades is grooved longitudi- " nally at its nipping edge and is covered with caoutchouc, " whilst the other nipping blade is knife-edged or bevelled to fit " into the grooves of the first one." By this means "an elastic " nipping action takes place as the caoutchouc gives way under " the slight pressure of the opposite blade, and is pushed into " the groove where the tips of the hair are held firmly, and " ultimately plucked off by a backward movement of the two " blades combined; this last movement is allowed for by springs " of caoutchouc attached to each side of the nipping bars and to " the fixed portion of the framing."

[Printed, 4*d*. No Drawings.]

A.D. 1854, October 10.—N° 2164.

WHITE, Henry Thomas, and ROBERTS, George.—" An " improved mode of rendering hats, caps, and other coverings for " the head self-ventilating." The diameter of the hat is made rather larger than usual, and its inside is lined to the depth of about half an inch from the brim with a flat helical spring. The spring is inserted between the leather and the body in such a manner that the edges will permit the passage of air through the spring when the hat is being worn. Or the air passage may be composed of wire otherwise bent, so as to form an elastic band "and " afford a space for the passage of air into and out of the hat " near the brim." This " elastic cushion " may be enveloped with bobbing net lace, or crape; it may be constructed with one edge broader than the other, to suit the shape of different heads, and it may surround the head entirely or only partially as preferred. The leather may be perforated slightly above the elastic bands. The current of air produced by the forward motion of the wearer will find its way up through the front of the cushion into the interior of the hat and " out through the back part." The plan is shewn applied to a common hat and to a hunting cap.

[Printed, 6*d*. Drawing.]

A.D. 1854, October 12.—N° 2180.

SEVILLE, Edward John.—(*A communication.*)—" An improve- " ment in the manufacture of hats." The object of this invention is "to cause the lining of a hat to form an integral part of the "body" and to be in fact a portion of the body so that it is not liable to become loose.

The body having been stiffened "with shellac dissolved in "spirits of wine, naptha, or ammonia and water," and being partially dried, the lining (of silk or other fabric) is laid on to the body "and is then by a warm iron made to adhere smoothly "thereto." The body is then cut to the required size, blocked, and ironed. "The materials to make the body of the required "strength are put on afterwards," and the body is then covered and finished in the ordinary manner.

[Printed, 4*d*. No Drawings.]

A.D. 1854, November 8.—Nº 2365.

GRAY, JOHN.—(*Provisional protection only.*)—"Improvements "in ventilating hats." In the upper part of the hat is formed an air passage all round it, into which the air from the inside may pass, and out of which it may escape through perforations round the outer circumference. In the manufacture several sets of perforations are formed round the circumference at the upper part where there is also a kind of inner hat, in which near the crown a series of holes are made all round. The air from the inside thus passes therefrom into the chamber between it and the ordinary hat, the perforations in the circumference of which open into the external air. The ventilation may be regulated by an internal slide passing over the openings in the inner hat.

[Printed, 4*d*. No Drawings.]

A.D. 1854, December 2.—Nº 2541.

FONTAINEMOREAU, PETER ARMAND, le Comte de.—(*A communication from Messrs. Langenhagen.*)—"Improvements in "the manufacture of palm leaf hats and carcases of hats." The palm leaves are split into two parts "in the direction of the "grain," and the pith is removed from the inner surface of the split leaves. The split leaves, either alone or mixed with unsplit leaves, various fibrous matters, india-rubber, gutta percha, or similar substances, are made up into hat bodies by plaiting, weaving, or other convenient means. The hat body may be left bare or be covered with muslin, silk, or other fabric.

[Printed, 4d. No Drawings.]

A.D. 1854, December 11.—N° 2599.

JACQUOT, François.—Improvements in the lining of hats, helmets, shakos, caps, and similar articles." The lining is a "tissue or looped fabric of silk or other fibrous substance" or " a perforated sheet of caoutchouc, gutta percha, leather, or other " suitable material"; it is made convex on the inner surface which comes into contact with the head "so as to form a sort of " circular elastic cushion." The convexity is formed "by stretching the lining upon a light frame of metal, whalebone, or other " suitable material consisting of two rings united by light rods" which act as stretchers. The lining "being stretched and fixed " to four points on one ring and to several points on the other " ring will assume a convex form in the interior."

The stretchers may be varied in form; ordinarily they are thin flat strips of steel with clips riveted to their ends for the passage of the rings.

[Printed, 6*d*. Drawing.]

A.D. 1854, December 29.—N° 2753.

FANSHAWE, Henry Richardson, and FANSHAWE, John Americus.—" Improvements in the manufacture of various kinds " of waterproof garments," namely, hats, caps, outer coats, leggings, and other outer garments. The material of which these articles are made (fine cotton or cambric for light ones, unbleached cotton sheeting or cotton canvas of a thin kind for heavy ones) is saturated (so as to close the pores thereof) " with caoutchouc, gutta " percha, jintawan, or any of the elastic gums or compounds insoluble in water." The outer or inner surface (or both if desired) is then coated " by any suitable method of waterproofing." The material when dry and free from tackiness is cut up; the seams are stuck down on one another, or are sewn together and a waterproof tape is fixed over each. The articles when made up are put into a vessel "capable of sustaining the requisite degree of steam pressure to give 280° Faht. or thereabouts" and are submitted to this heat for from two to three hours; they are then taken out and spread upon a table (if necessary) and the uncoated side is coated with an oil mixture described below.

The compounds used are,—1. (A "liquid compound or solution.") —Masticated india-rubber, 10 parts; asphaltum, 3 parts; pure mineral naptha, 50 parts; vegetable black, 1 part.

2. (A "paste compound.")—Masticated india-rubber, 10 parts; asphaltum, 3 parts; pure mineral naptha, 10 parts; vegetable black, 1 part.

If the compound "has to be submitted to heat for sulphurizing," it is necessary to leave out the asphaltum and "include the curatives," say from 7½ to 15 per cent. of crude sulphur to the weight of india-rubber.

3. (A "curative or sulphurizing liquid compound.")—Masticated rubber, 10 parts; sulphur, ¾ to 1½ parts; vegetable black, 1 part; pure mineral naptha, 50 parts.

4. The same as No. 2, substituting sulphur ¾ to 1½ parts for the asphaltum.

5. (The oil mixture.)—Boiled linseed oil, 8 lbs.; vegetable black, 1 lb.; curd soap, 1½ oz.; water, 4 lbs.

The first 4 compounds are made in the ordinary manner. To make the fifth, heat the water to "near the boiling point;" put in the soap "shred thin;" when thoroughly dissolved by stirring add the vegetable black; "beat the whole up to a fine black "fluid mass," and then gradually introduce the oil.

The patentees recommend that the fabric for heavy garments should (before being coated) be immersed for several days "in a "series of oak bark oozes, beginning at a low degree."

[Printed, 4*d*. No Drawings.]

A.D. 1854, December 30.—Nº 2757.

MALLINSON, George, and **RIDINGS**, Horatio.—(*Provisional protection only.*)—"An improved manufacture of woven "fabric." The inventors produce a double fabric, "which is "woven together in such wise that the weft is floated on the surface of the upper fabric."

These floated portions of weft "may be cut asunder lengthwise "of the piece" to make ribbons or trimmings; or they may be cut in suitable places to form flounces; or they may be cut to form tassels and fringes. The fabric is also applicable for making caps, bonnets, and other articles of wearing apparel.

[Printed, 4*d*. No Drawings.]

1855.

A.D. 1855, January 26.—N° 204. (* *)

SEARBY, George.—"Improvements in the manufacture of "boots and shoes, also applicable to other articles made of or "partly formed of leather." These boots and shoes are made to fit the shape of the foot and ankle without seams, the sole being attached in any convenient manner.

"The leather previous to being curried or afterwards" is saturated with water or a solution of soda in water, and is put upon an ordinary last or one capable of being removed in two or more pieces. The leather is stretched upon the last, softened and worked to the required shape, drawn partly over the sole of the last and fastened by tacks; when removed it will retain its shape. The leather is rendered more pliable "by shaving or cutting off the "external surface or the cuticle of the skin." A waterproof lining is put "between the lining of the sole and of the upper "leather," and the boot or shoe is soled "previous to removing "the upper leather" from the last. There is cut "a slit or opening in the leather at the top of the last forming the ankle."

For ladies' or dress boots and shoes the leather is embossed either by means of a mould or "by having a raised surface upon the block or last."

The leather is enameled or varnished whilst on the last, taking care to keep the last revolving during the time that the enamel is baking or being dried.

The invention is applicable to boys' or mens' caps, bathing caps, goloshes and similar articles.

[Printed, 4*d*. No Drawings.]

A.D. 1855, February 23.—N° 405.

ALLAIRE, Simon Martin.—(*Provisional protection only.*)—"Improvements in manufacturing hats, caps, and bonnets." The inventor forms the body "of a knitted fabric of cotton, linen, wool, "silk, or other material." The body is made "in one piece" whereby "a yielding and elastic body is obtained;" being made "upon a particular loom" it will "assume any shape of hat, cap, "bonnet, or head dress, civil as well as military, for men, women,

" and children." The body " after being prepared " is covered with silk plush or other required covering.

[Printed, 4*d*. No Drawings.]

A.D. 1855, March 29.—N° 700.

BLAIR, John.—" Improvements in hats and other coverings for " the head." Hat bodies are so made " as to form a thin space " between the interior surface and the outside of the hat at the " part where it fits upon the head." This space communicates by perforations with the interior " above or around the upper part " of the head." The cylindrical portion of the hat body is composed of plies or layers of woven material stiffened by shellac and formed into a single thickness for about half the length of the cylinder from the crown. For the remainder of the length " other " plies of materials are inserted between the outer and inner plies " in such a manner as to form two thicknesses down to the " brim." The brim is attached " to the outer thickness of the " lower part." The inner thickness " is slightly contracted so as " to leave a thin space between itself and the outer part," but it gradually merges into the body of the hat higher up, and it may be made flexible. The leather is fastened to the inner thickness.

[Printed, 8*d*. Drawing.]

A.D. 1855, April 7.—N° 775. (* *)

HUSBAND, Richard, and MALLINSON, George.—(*Provisional protection only.*)—" An improvement in the manufacture " of hat plush." " The pile or nap of hat plush manufactured " according to this improvement is formed from the weft thread " or shoot, instead of as at present from the warp, and conse- " quently a more uniform and regular appearance of the pile " when cut is produced (free from ' steps ' or irregularities, which " are not of unfrequent occurrence in the hat plush at present " manufactured), by a peculiar arrangement of the weft threads. " An important feature of this invention is to allow the weft " thread in the said manufacture to float over any given number " of warp threads, and then to bind through such a number of " alternate warp threads as required. The ' cutting up ' of the " race or the producing of the pile is effected by similar means to

" those at present employed in cutting ordinary fustians, and is " to be performed exactly in a similar manner."

[Printed, *4d.* No Drawings.]

A.D. 1855, April 16.—N° 833. (* *)

HUSBAND, Richard.—(*Provisional protection only.*)—" Certain improvements in the manufacture of 'hat plushes' of spun " silk and other spun yarns." The "improvement is effected by " producing a 'nap' or pile by cutting instead of raising." "The " 'nap' or plush, after having been cut, may be opened out, if " necessary, by means of 'cards,' hard brushes, or other suitable " instruments."

[Printed, *4d.* No Drawings.]

A.D. 1855, May 31.—N° 1241.

LEETCH, James.—(*Provisional protection only.*)—" An improved construction of helmet or head-dress." A light frame " of steel bands or springs " is so arranged over and about a cap of leather or other suitable material " as to entirely protect the " head from outward violence." The frame may be left bare or be covered with some light material to render it more ornamental.

"The shock of a blow upon a helmet so constructed recoils " upon the object which strikes it on account of the curved form " and the elasticity of the steel bands."

[Printed, *4d.* No Drawings.]

A.D. 1855, June 12.—N° 1341.

METCALFE, Thomas.—(*Provisional protection only.*)—" An " improved mode of manufacturing collapsible hats and bonnets." These articles are made of " straw, grass, or other similar plait," and may be " pressed flat and packed away without the risk of " damaging the fibre of which the plait is composed."

The article is formed " of sections of suitable shape for folding upon each other, and " the run of the plait in the several parts " is so arranged that it shall be "parallel to the edges of those " parts." Where the shape will not admit of such arrangement, such parts are provided "with a binding of plait which " will form the edge thereof." The several sections when thus made "are sewn together to form a hat or bonnet, which will " retain its expanded shape while on the head."

[Printed, *4d.* No Drawings.]

A.D. 1855, June 26.—Nº 1462.

BUCKNALL, Joseph John.—(*Provisional protection only.*)—
" Improvements in the manufacture of hats and caps, and the " employment of certain tools for producing the same." To obtain ventilation for the head of the wearer, numerous holes are perforated in the entire cylindrical part of the hat, and in the crown. The lining may if desired regulate the ventilation.

In perforating the hat body, a piercing tool is employed carrying a number of punches, which can be used by hand or in a press. In some cases a roller is employed, formed with a number of projections, for the same purpose.

[Printed, 4*d*. No Drawings.]

A.D. 1855, August 3.—Nº 1765. (* *)

JOHNSON, John Henry.—(*A communication from Nicolas Ernest Theophile Petin.*)—(*Provisional protection only.*)—" Im- " provements in the manufacture of metallic waterproof fabrics or " materials, and in the application thereof." The foundation of the fabric is metallic cloth or wire gauze. " For a transparent " fabric," it is steeped in or coated with a mixture " composed of " unctuous oils boiled with litharge, of caoutchouc, of collodion, " of copal, of the gum of essential oil of turpentine, or of strong " glue." For " an opaque waterproof fabric," it is coated with gutta percha, bitumen, or tar. Or the transparent fabric may be covered " with a coating of oil paint, if it is to be even and smooth, or with sand " if it is desirable to render it fireproof." Sawdust, powdered glass, mother-of-pearl, metal or metallic products, mineral, vegetable, and animal substances, hair, fabrics, paper, and veneering, may be employed. The fabric so prepared is placed in a stove " to fix the substances of which it is composed, and " afterwards it is exposed to the air to dry thoroughly." Each coating must be allowed to dry before another is applied. The fabric is to be used in " the construction of sword cases, helmets, " articles of saddlery, decorations for rooms, parts of carriages, " ornaments, &c."

[Printed, 4*d*. No Drawings.]

A.D. 1855, August 8.—Nº 1796.

COOLEY, Robert Barlow.—" Improvements in the manu- " facture of hats." The body and the covering of these hats consist of "a tubular elastic fabric," that is to say, "a knitted or "looped fabric."

To make the body of the hat the fabric should be of cotton, "closely knitted and rather fine in texture;" it may be made on a circular knitting machine of about 23 inches in circumference. The tube is sewn or cemented "across the top so as to close it;" it is stretched over a block, and a cord is tied round the block over the fabric "where the body is to be turned up to form the "brim." The fabric then receives "a coat of proofing," which is allowed to dry. The body is then placed in the "brim frame," and the portion below the cord is stretched out, brushed over with proofing, and ironed down. When the proofing of the first layer of fabric is dry, another (and if required a third) tube is stretched over the block and brim frame, and the foregoing process is repeated.

To cover the body a tube of knitted cotton fabric with a silk pile is preferred. The tube "without previously closing the end" is drawn over the body, which is cemented to make the tube adhere. About 3 inches of the tube is left over at the end to form "the crown;" then by watering and ironing "the tube is made "to adhere to the body round the top of the cylindrical part of "the hat, and the crown is gradually ironed down from the circumference to the centre, and a join is formed across the top." The cylindrical part is watered and ironed; the fabric is ironed down on to the upper surface of the brim; it is then "brought "round and ironed down on to the under part of the brim," and thus the body "is covered entirely with one piece of fabric."

Instead of making a join across the crown "a circular piece of "the fabric may be stitched into the end of the tube."

[Printed, *4d.* No Drawings.]

A.D. 1855, August 13.—N° 1838. (* *)

THORNTON, Albert, and THORNTON, Frederick.—"Improvements in the manufacture of elastic or knitted plush or "piled fabrics for hats and other purposes."

"This invention has for its object improvements in combining "knitting machinery for making tubular knit fabrics with pile "thereon, suitable for the manufacture of hats and other articles. "For this purpose a series of needles are arranged in a circle, as "is usually the case when manufacturing tubular knitted fabrics.

" There is also between each pair of neighbouring needles a sinker
" with double nebs, suitable for receiving two yarns or threads,
" one for making the ground or body of the fabric, and the other
" for making the pile. These sinkers are carried by bars, which
" are each capable of sliding, and also of acting as a lever, by
" moving as on a fulcrum, the sliding and rocking of these bars
" being guided by fixed cam courses or surfaces. The sliding
" bars at the moment of sinking the threads between the needles
" are pressed on by a spring, having on it a short incline, which
" presses in succession on the bars just above and a little forward
" of the fulcrum, by which the desired extent of sinking of the
" pile thread or yarn by the sinkers is more readily accomplished;
" and in order to cut the pile, a fixed stationary cutter is placed at
" a part of the machine, and the sinkers are provided with projections, which, on the sinkers being raised up, lift the needles
" out of their ordinary position, so that the loops of pile threads
" thereon are opened, and they pass on to the knife and are cut
" thereby."

[Printed, 1*s*. Drawings.]

A.D. 1855, August 22.—N° 1899.

BLUM, Michel.—(*Provisional protection only.*)—" An improved " hood." This hood may be adapted to any over coat or cloak.

It is made with an opening " before the face " and with a metallic border round the opening. " A pane of translucent material," such as glass or mica, set in a frame is hinged to the lower part of the border, and the upper part of the frame " is hooked into " an eye " in the border, " so that the framed pane may be secured " before the face to protect it against cold or bad weather, or it " may be allowed to hang down on the breast." The air is renewed by means of two openings on each side of the frame and from beneath.

[Printed, 4*d*. No Drawings.]

A.D. 1855, October 1.—N° 2181.

BELLFORD, Auguste Edouard Lorodoux.—(*A communication.*)—" Improvements in ventilating hats or other coverings for " the head." The hat is made in two parts, which are so connected that the upper part may be adjusted to or from the lower one. The divided body, at the junction of the two portions, is provided with a piece of open straw work, gimp, strip, india-rubber, or other reticulated or perforated telescopic lining. In the interior of the hat are placed extension slides, which, when it is required to raise the upper portion for ventilation, are moved as far as requisite, and held in position by set screws. When the open-work strip is thus exposed, the air can enter through its perforations. The drawings shew a straw hat on this plan.

As applied to bonnets, "the slides will be placed horizontal or " oblique," and the crown portion of the bonnet will be adjustable.

[Printed, 6*d*. Drawing.]

A.D. 1855, October 9.—N° 2251.

JAY, WILLIAM CHICKALL.—(*A communication.*)—(*Provisional protection only.*)—"An improved manufacture of collapsible hat " or bonnet," for the convenience of "stowage or carriage, with- " out destroying or impairing the elegance of the article." The material of which the hat or bonnet is made is sewn on or adapted to a frame of whalebone, cane, metal, or other suitable material. The frame consists of a number of "jointed ribs, extending from " the brim to the edge of the crown." The joints "are situated " at the angle formed by the junction of the brim with the body " of the article," and when the hat or bonnet is to be collapsed, " the ribs are folded back into a vertical position."

To maintain the hat or bonnet in shape when extended, "move- " able ribs are inserted with the jointed ribs at proper distances " apart;" these slide in and out of tucks or other contrivances, so that when required they "may be drawn back, and the jointed " ribs allowed to be folded up."

[Printed, 4*d*. No Drawings.]

A.D. 1855, October 12.—N° 2281.

KAY, ROBERT HENRY, RICHARDSON, ALFRED THOMAS, and MALLINSON, GEORGE.—"Improvements in the manufac- " ture of plain and ornamental woven fabrics," suitable for hat plushes, mantles, vestings, trimmings, and other purposes.

The weft threads "are floated over the warp threads," and "the " races thus formed are cut to produce the pile." By floating the weft over a sufficient number of warp threads, and by employing weft of suitable material and colours the fabrics when cut and finished "may be made to resemble the furs of animals or

" the feathers of birds." Other plain or ornamental fabrics may be produced, "according to the draught and tie-up employed." In the annexed sheet of diagrams "several draughts and tie-ups " are given."

In weaving plain fabrics, it is preferred to employ two shuttles, one containing the weft for the back, the other the weft for the face; for ornamental fabrics two or more shuttles may be required. The floated parts are cut in the ordinary manner, and the fabrics are then printed, dyed, or finished by any of the " known processes."

The claim is the employment of draughts and tie-ups for the production of the above-named fabrics "formed by floating flax, " silk, spun silk, cotton, woollen, worsted, mohair, or alpaca " weft threads, or any combination of two or more of them, over " the warp threads."

[Printed, 10*d*. Drawing.]

A.D. 1855, October 20.—N° 2351.

MASSIP, Pierre Arnaud. — (*A communication from Désir Birac.*)—"A machine for preparing hat linings." The linings are generally made of paper and silk pasted and pressed together.

The patentee describes (1) a "pasting machine:"—The paper passes over an endless feeding cloth to three pasting cylinders (one of which takes the adhesive matter from a box), and thence to circular brushes. Another endless cloth carries the silk, which meets the paper either before or after subjection to a knife, "which " cuts them into equal parts;" the two are then pressed together, and pass on over drying cylinders and a steam box. The united substance now leaves the endless cloth; it is placed by hand between cylinders, "in order to be smoothed, watered, figured, or " glossed," and is then passed under printing cylinders. A " transverse knife" is arranged "to cut the materials lengthwise." Knife blades scrape off the paste or colour from the pasting and the printing cylinders. The whole machine "is mounted on two " cast-iron supports bolted to a framework of oak," and the cylinders "are put in motion by means of chains, straps, and cog " wheels, their speed being regulated by a flyer."

(2). A machine for cutting the prepared tissue into "a round " or oval form:"—The machine is provided with several discs, " having an outer circle of about two-thirds of an inch in depth;"

one of these is secured on a vertical steel rod. "Above the disc" are blade holders, "which move in slides," and the blades are fixed by means of thumb screws. The blades "cut out the round " or oval pieces of the hat linings by moving round the circum- " ference of the disc." The holders "are provided with a fine " screw thread, which serves to effect a progressive descending " movement on the blades," so as "to prevent the tearing of the " stuffs to be cut;" they have also a projecting piece which fits into a hole in the disc. The machine may be worked by hand or other power.

(3.) A "folding machine:"— A cast-iron disc carries a rod which fits into a vertical rod worked by a weighted lever. Under the disc are "four pieces" jointed to links which are fixed to a ring on the vertical rod. When the lever is brought down, the pieces "expand and press out the material about one-sixth of an " inch more in diameter, to form the fold at the bottom of the " lining of the hat." As soon as the lever is released, a spiral spring raises the disc.

[Printed, 1*s*. 2*d*. Drawings.]

A.D. 1855, November 1.—N° 2433.

LEETCH, JAMES. — (*Provisional protection only.*) — "An im- " proved method of constructing apparatus for the covering of " the head." This "expanding metallic head protector" consists of "a band of tempered steel with elongated perforations," joined together by slots and pins, "and so arranged as to fit various " sized heads." Elastic materials are introduced, so as "to " protect the head from the effects of a blow or any heavy body " falling upon it."

[Printed, 4*d*. No Drawings.]

A.D. 1855, November 5.—N° 2473.

GARDEN, ROBERT SPRING.—"Improvements in the manufac- " ture of hats." Hats or caps are ventilated by inserting between an inner lining and the hat itself a thin layer of cork or other light substance perforated for the entrance of air, which escapes therefrom at an opening at or near the top. The perforated material may surround the interior of the hat or be confined to the back, but it is preferably restricted to the portion in front over the forehead of the wearer.

Air passages may also be produced "by laying beside each "other separate slips of cork," leaving openings below or above the brim of the hat; they may be covered with any porous fabric.

Or to the inside sides of each hat may be simply fixed the two ends of a strip of hat-body, leaving a sufficient space between it and the hat itself for ventilation, and concealing external apertures with the silk plush covering the bottom of the brim.

Hats, helmets, and hunting caps are strengthened by means of a spring which is secured within the crown by studs or other means.

[Printed, 4*d*. No Drawings.]

A.D. 1855, November 24.—N° 2648.

CARRINGTON, Samuel Ratcliffe.—"Improvements in the "manufacture of hats." This invention relates to that part of the lining of the hat "which is technically called the leather or "pad," the object being "to obtain a yielding substance to fit "the head, and to absorb perspiration, and to prevent the perspi-"ration passing through the pad."

An "absorbent material or fabric," and a "repellent or non-"absorbent material" are employed; flannel or felt is preferred for the former; for the latter a cotton fabric steeped in a solution of shellac in ammonia, allowed to, dry, and covered on one side with a solution of gutta percha. The flannel or felt is laid on the gutta percha and caused to adhere by the application of a heated iron. The band thus formed is made up on a block, "the "absorbent material being at the inside," after which it is faced with silk or other substance "and made up in the ordinary "manner."

[Printed, 4*d*. No Drawings.]

A.D. 1855, November 29.—N° 2697.

NEWTON, Alfred Vincent.—(*A communication.*)—"An "improved process of manufacturing hats." This invention relates to machinery for (1) "forming a hat or hat body;" (2) "sizing hats or bringing or reducing the same to a proper size "and shape;" (3) "sticking, scalding-in, and beating-up the "nap of hats."

1. A cone stands on a table; round the table revolves a ring "closely fitting the same to prevent the escape of steam," and on the ring stands an outer cone. Steam admitted into the inner cone heats the space between the cones and thereby the outer cone, so that fur blown on to the outer cone "is dried to a sufficient degree to harden it" and allow it to be handled and removed "without the use of any inlayer or supporting frame." "The delivering chamber" contains "a picking cylinder" and a rotating brush; outside it is an apparatus (a lever provided with a cam) "for raising and lowering the delivering end;" also a lever for giving it a rocking motion; and steam pipes "adapted to the mouth" so that "a jet of steam or hot water, or both together," will "impinge directly" upon the outer cone during its revolutions. Fur descends into the chamber from a hopper provided with a cone "which may be opened or closed to increase or diminish the draft of air."

2. A vat is kept supplied with hot water. Within the vat is a vibrating beater "with its two sides slightly hollowed and its face corrugated." At each side of the vat opposite the beater are "adjustable plates or beater heads corrugated in a manner similar to the sides of the beater." The hat bodies put into a bag are placed inside a revolving apron. The vat may be made in compartments, each having its beater, beater heads, and apron.

If "the cold process of felting or sizing" is preferred, the vat is supplied with cold water, and the hat bodies are previously saturated with the following "saponaceous composition:"—Dissolve 1 lb. of expressed oil of tallow and 2 oz. of potash in 1 lb. of hot soft water. Boil, and when cold add ½ lb. of china clay; mix well together, and add 1 oz. of spirits of ammonia. Submit the mass to a moderate heat. When the bodies have been sufficiently felted or sized, the cold water is drawn off, hot water is let in, and the bodies are again rolled and beat until the composition is washed out of them.

3. The machine for sticking the nap "is constructed very much upon the same principle as that already described for making the bat or felt;" the delivering chamber is somewhat differently shaped, and is provided with more pickers; a description of it is given in the specification.

The machine for scalding-in consists of a cylinder of wire cloth arranged so as to rock inside a steam-tight box, into the bottom of which steam is admitted. The hat bodies are placed one over another with flannel cloths between, and the innermost on a soft bag or cone of sponge covered with a flannel cloth; they are then put into the cylinder and rocked "until the nap is "thoroughly scalded-in."

The connecting parts of some of the machines, and "the ope-"ration" of all, are detailed in the specification.

[Printed, 1*s*. 8*d*. Drawings.]

1856.

A.D. 1856, January 4.—N° 32.

SIMMONS, William.—"An improved hat body." The interior of the hat body "is rendered sufficiently ornamental" to dispense with a separate lining. For this purpose "a coating or "covering of cotton, wool, or silk flock, or a coating or covering "of glass or sand, or any other suitable pulverized material," is combined with the interior surface of the hat body during its manufacture, "that is, whilst the shellac or varnish is in a fluid "or molten state." The material is "dusted, or sifted, or thrown "upon the interior of the hat body in any convenient manner."

[Printed, 4*d*. No Drawings.]

A.D. 1856, January 8.—N° 58.

BOWRA, Matthias Edward.—(*Provisional protection only.*)—"Improvements in the nature and manufacture of waterproof "garments and other goods." Caoutchouc, either vulcanized or otherwise, or caoutchouc with any of the known mixtures at present in use, is employed for the purpose of waterproofing cloths for garments and other goods.

The garments are cut in the usual way, and at the skirt is attached a piece of waterproof cloth of sufficient length and breadth to be used "as a ground sheet or cover, or coat, cloak, over-"coat, or cape."

A cape is put on the garments in the usual way, attached or detached, and under the cape the back, chest, and shoulders are perforated with numerous holes. The seams of the shoulder, side and sleeve also are perforated, the holes and seams being covered with a "waterproof cape, strapping, or bands, leaving sufficient "space at the sides and ends to allow free escape" for the perspiration.

The invention is applicable also to caps, hoods, gloves, boots, shoes, and goloshes.

[Printed, 4*d*. No Drawings.]

A.D. 1856, January 17.—N° 126.

CARRINGTON, SAMUEL RATCLIFFE.—(*Provisional protection only.*)—"Improvements in the manufacture of hats, and in "machinery or apparatus connected therewith." The first improvement consists in manufacturing hat bodies of layers of calico or other suitable fabric combined by passing them "through "the ordinary waterproofing or stiffening solution of shellac, "varnish, &c.," and afterwards submitting the whole "to the "operation of calendering."

The second consists in the "use of calendering rollers or "machinery for the above-named purposes."

The third consists in the "use of dies, stamps, or cutters, for "the purpose of cutting out, stamping, forming, or shaping the "brims of hats."

[Printed, 4*d*. No Drawings.]

A.D. 1856, January 26.—N° 219.

WALKER, ALEXANDER JAMES, and BENNETT, WILLIAM.—(*Provisional protection only.*)—"An improved method of forming "hat bodies or other felted articles." The inventors cause fur, wool, or similar felting material to be deposited upon a flat stretched-out sheet of india-rubber or similar elastic substance of the desired size and shape, and to ensure a uniform deposit they use "a ring or other enclosure within which the felting "material is uniformly deposited" to the required thickness. They then cover up the felting material in its loose state as it lies on the sheet with "a second elastic fabric," attach the sheets together at their edges, and wind the whole on to "a cone former "or mould." By motion from the hand or otherwise "the "intervening felting material is felted together," and will be found "upon removing the outside elastic covering to be pro- "perly shaped and felted ready for removal from the cone."

[Printed, 4*d*. No Drawings.]

A.D. 1856, March 24.—Nº 695.

HUSBAND, Richard.—" Improvements in the manufacture of " hats." The first part of this invention relates to the prevention of the " overlapping vertical seam," which in the ordinary manufacture " is cemented together," and " owing to the re- " duplication of substances is liable to be thick and otherwise " inelegant."

The patentee, having determined " in what part of the intended " body the vertical seam in the side crown of the internal sur- " face fold shall be situated," makes a foundation " as for an " ordinary gossamer body," but with its vertical seam " opposite " to, or at least two inches from, the line along which the cor- " responding seam in the side of the intended internal surface " fold is to come." In adding " a covering or second fold " to the foundation he places " the junction of the ends of the side " covering " not less than " four inches from the vertical seam " of the foundation." When the stage of manufacture is reached at which " the rough body has had its block withdrawn," he shapes a fabric well stiffened with starch or other transparent stiffening to fit the inside of the body and form " a side crown." He damps the inside of the body, inserts the side crown, and places it " so as to form an inside fold upon the foundation," and to have " its vertical junction seam opposite to, or at least " two inches from, the vertical seam in the foundation and also " not less than two inches from the corresponding seam in the " covering fold." He then places " the finishing shell " inside the side crown, puts the block into the shell, and irons up.

The second part " relates to the lining tip " when " applied in " hats having bodies made as above described." The tip is to be inserted " after the hat has been finished ;" it is to be fitted into its place " upon a thin layer of fresh spread spirit proof," and to be fixed by ironing " gently with not too hot an iron."

[Printed, 4*d*. No Drawings.]

A.D. 1856, April 2.—Nº 797.

BONNARD, Lodowiska.—(*A communication from Jean Baptiste Bonnard.*)—(*Provisional protection only.*)—" Improvements " in collapsible or folding hats and bonnets, and in flexible " articles to be applied to other coverings for the head." The first part of the invention refers especially to women's hats and bonnets, although a man's hat "may be similarly constructed."

The body is made "with a number of strips of whalebone or "other suitable material in casings in the soft material of the "article." The crown is "quite pliable and may be crumpled "up." The brim "extends all round and acts as a sun-shade;" it is made of soft material "having a number of radial casings" for the reception of whalebone strips; in order to support it when "secured to the lower part of the body," a pliant material "is "attached all round the body near the top and also to the brim "about midway of its breadth." The brim and body "have a "separation on one side, from which the brim closes and opens "in the manner of a fan."

The second part relates to the application of the flexible brim to a man's hat as a sun-shade:—The stiffeners are placed alternately above and below the brim in casings, and keep the brim extended when it is applied to the hat brim. The brim "has a "separation at one side for its removal from the hat."

[Printed, 4*d*. No Drawings.]

A.D. 1856, April 14.—N° 893.

NEWTON, Alfred Vincent.—(*A communication from James Seeley Taylor.*)—"Improved machinery for felting hat bodies." A framing supports a felting vat wherein are mounted "four "concave rollers" in such manner that "a central space is left "between them for the purpose of receiving at one end thereof "rolls of felt to be operated upon," and of propelling the rolls through it and discharging them at the other end. The journals at one end of the rollers carry each a wheel round which passes an endless chain driven by a chain wheel on the main shaft; they "are not rigidly attached to the rollers, but are connected "by hook and eye or link connections" so that they can be "arranged parallel with each other," and be "conveniently geared "while the rollers are oblique to each other." This oblique arrangement of the rollers "is such that the axis of any one "roller if continued would cross the axis of any other roller of "the series." The rollers nearly "touch each other" at one end of the vat, but are "farther apart" at the other, thereby giving the central space "a tapering form" to facilitate the insertion of the hat body and to allow "for its gradual condensation as the "felting process progresses."

The journals of two of the rollers "turn in bearings in a box," which is so fitted to the framing "as to be capable of a limited "horizontal sliding movement." The box is furnished with a yoke which receives within it a cam turning "freely on a fixed "stud secured to the framing." The cam carries a spur wheel gearing with a spur wheel on the main shaft and imparting to the box "a horizontal reciprocating movement." These journals allow the rollers "to move outwards" from the central space, and springs applied to them "make the rollers act with an elastic "pressure."

The vat contains hot water or other liquid, in which the hat body is to be kept "partially submerged during the process." If the body is introduced in a moist state, liquid will not be necessary in the vat.

The rollers may have either smooth or corrugated surfaces. The hat body "should be partially felted," or at least sufficiently hardened "to bear the rolling and rubbing action of the machine," previous to its being introduced.

[Printed, 8*d*. Drawing.]

A.D. 1856, May 1.—N° 1034.

BROOMAN, RICHARD ARCHIBALD. — (*A communication.*)— "Improvements in machinery for felting or planking hat bodies." An endless floor passes round two rotating drums which are supported on a frame. The floor consists of a series of slats or laths hinged together in such manner that the floor can bend round the drums; to give it solidity and levelness small rollers are pivoted in a frame beneath its upper surface. The rotation of the drums imparts to the floor "a slow progressive motion." A felting plate above the floor consists of a strong flat plate or board "suspended horizontally on ways at the four corners and "kept down by springs." The tension of the springs is regulated by screws, and the plate "may be inclined a little at that "end where the hats are delivered." A "rapid vibratory motion" is given to the plate by means of a crank and connecting rod or otherwise. When the hat body (previously dipped in hot water and formed into a roll) has passed through the machine, it rolls down an inclined plane.

Modifications:—A band "kept up by a plate or stationary plate "*beneath*" may be used instead of the floor.

A second felting plate may be placed beneath the floor, and the hat bodies may "continue across to the front of the machine" instead of rolling down the incline. With this arrangement workmen may be "stationed on both sides and thus work from "end to end."

[Printed, 6*d*. Drawing.]

A.D. 1856, May 8.—N° 1084.

BROOMAN, Richard Archibald.—(*A communication.*)—"Improvements in machinery for felting or sizing hat bodies." This machinery consists of "a revolving circular floor or table in "connection with a vibrating plate overlying the table."

The table is mounted on a vertical shaft and made to revolve by means of a pulley or gear-wheel. The plate is circular and of the same diameter as the table; it is supported on a vertical shaft "placed centrally over the lower shaft;" its lower end is stepped in the top of the shaft, and its upper end in the framing of the machine. Usually two openings "are made in the edge of this "plate" on opposite sides, one for the introduction, the other for the discharge of the hat body; but if the table is large enough, there may be more openings. The plate is caused "to vibrate "backward and forward to the proper extent" by means of a shackle bar connected to a crank at its opposite end, and a weight, screw, or spring may be employed to give the requisite pressure upon the hat body. The surfaces of both the table and the plate may be smooth or "ribbed or corrugated with "radial ridges." In order that the pressure may be kept up during the whole of the operation, either the table or the plate (or both) is "inclined around the working edges so that, as the roll travels "on, it constantly enters a more contracted space."

The invention "may be varied or modified in several ways "while still retaining the general principle, namely, the employ-"ment of a vibrating in connection with an onward motion." One modification is described; a cylinder is substituted for the table, and "a concave shell" for the vibrating plate.

[Printed, 8*d*. Drawing.]

A.D. 1856, May 10.—N° 1109.

WOTHERSPOON, Robert.—"Improvements in hats and "other coverings for the head." For the sake of ventilation and of proper fitting an inner shell is placed within the usual outer shell or body, so as to leave an intermediate air space all round the head between the hat proper and the shell, and from the brim to the crown. This inner loose shell is perforated both at top and bottom, and an opening is made in the centre of the crown for the passage of the air. The inner shell may be made of a coarse net fabric stiffened by gum or shellac; it is attached to the hat proper at the crown. The hat may be additionally supported by connecting pieces placed at intervals round the hat and fixed to its lower edge at one end, and at the other end to the inner shell at a distance of two or three inches from the bottom edge. The usual fitting band is fixed to the inner shell.

[Printed, 6*d*. Drawing.]

A.D. 1856, May 14.—Nº 1139.

HARDING, Gustavus Palmer.—"An improvement in the "manufacture of cloth bonnets." The improvement consists in manufacturing cloth bonnets "without stitching or sewing (and "waterproof or not) by blocking cloth into any desired form and "then cementing it on to a shape corresponding to the form on "which the cloth was blocked." To make the bonnet waterproof the patentee uses either a waterproof cement or a cloth previously made waterproof. He describes "a convenient mode" of manufacture, but he does not confine himself to the "precise "details thereof nor to the agents that may be mentioned."

[Printed, 4*d*. No Drawings.]

A.D. 1856, June 2.—Nº 1307.

AVERY, Delia.—"Improvements in the construction of bon-"nets and other coverings for the head." These bonnets are "flexible and capable of being compressed without material injury "either to the shape or to the substance" by dispensing with "the ordinary stiff wiry shape" and by the use of elastic bands and "certain rolls, cords, or other suitable device to give an elastic "character to the bonnets."

Elastic bands are introduced "where the bonnet binds around "the head or in such parts as may be found convenient and "necessary;" they are encased in a strip of silk or muslin and are attached to the inside of the bonnet. A piece of elastic *webbing* may be arranged "to expand or contract at the back of

" the head, so that a certain size of bonnet may fit various sizes " of heads."

The rolls are made of "some soft fibrous flexible substance" encased in a woven material having some degree of elasticity, or of muslin or other woven material "rolled or twisted and thus " formed into an elastic and flexible cord by itself." These rolls may be "incorporated with the materials of which the bonnet is " composed, or they may be formed separately and then be " covered in the same manner as in using the ordinary shape or " foundation."

Hats "may be made on the system herein described."

[Printed, 4*d*. No Drawings.]

A.D. 1856, June 20.—N° 1457. (* *)

PIGOTT, HENRY.—(*Provisional protection only.*)—" Improve-" ments in hats and other coverings for the head." The lining of the hat is attached in the usual way near the brim; but the portion embracing the temples and forehead is disconnected from the hat body. The body at this front part is double or has a lining piece; this double part extends to about the depth of the lining, and an air space is left between it and the body, the edge of the lining being attached to the edge of the loose inner lining instead of to the body. Both the fitting lining and the inner diaphragm or layer are perforated.

" The difference between the moulded form of the hat body and " that of the fitting lining and internal diaphragm is produced " by a moveable metal slip which is added to the block for the " body and removed therefrom for the lining mould."

[Printed, 4*d*. No Drawings.]

A.D. 1856, June 25.—N° 1494.

ROHEAD, JOHN.—(*Provisional protection only.*)—" Improve-" ments in hats and other coverings for the head." The lining piece, embracing the head, is made less in diameter than the hat body, and, together with an internal diaphragm behind it, is attached loosely to the body at the part where the brim joins the body. This junction is effected by an interposed strip of gimp sewn to the bottom edge of the lining and its internal diaphragm and to the body at its junction with the brim. The fitting lining and the internal diaphragm are perforated.

[Printed, 4*d*. No Drawings.]

A.D. 1856, July 3.—N° 1567.

BROWN, Joseph.—" Improvements in hats and caps," also applicable to soldiers' caps and shakos. They are ventilated by making the body without a crown, or with a crown having sufficient opening at the sides. Over this is another hat or cap body without a rim, but with a crown to fit the first-named body and so arranged that it may be pushed up to admit the air. Or if the outside hat or cap body is not required to rise, a space is left for ventilation between the outer and inner body. The inside may or may not be perforated. Or the hat or cap can be made in the usual way with open work sides, the outer covering to be drawn down over the other part of the body and secured with an india-rubber band. Or the cover may be entirely loose. Several modifications are shewn in the drawings.

The head linings of the hats in which the outer cover is fixed to the inner body may be water and air-proofed on the side away from the head, and be adapted for the inner body; a gauze or perforated cover may be attached to the top of the inner body; and in these instances the inner bodies may be made skeleton bodies.

An arrangement is shewn by which the outer perforated body may be opened or closed by moving it up and down in the inner one. The outer body has a crown and no brim, and is fitted on each side with slips of whalebone or cardboard, to which are secured the heads of screw pins, passing through them and through a slot in the inner body. By this means the outer case can be slid over the inner one and held in position.

[Printed, 8*d*. Drawing.]

A.D. 1856, July 8.—N° 1614.

PIGOTT, Henry.—(*Provisional protection only.*)—" Improve- " ments in hats and other coverings for the head."

The lining of the hat is attached in the usual way near the brim, but between the portions embracing the temples and forehead there is left a thin space to admit air and to allow of the self-adjustment of the lining. Two plies of material are interposed between the lining and the hat body. These plies are joined together at their inner or upper ends; one is attached to the brim at its lower or outer edge, and the other to the *lining at its* lower or outer edge. These plies may be perforated.

Horsehair cloth is preferably used for the outer ply, whilst the inner ply may be of the same material as the hat body itself. The plies may also be inserted along with the lining. The air passes through the permeable horsehair cloth into the internal space above the head, and perforations are formed through the inner ply and the lining to admit air in that direction also.

[Printed, 4*d*. No Drawings.]

A.D. 1856, August 1.—N° 1822.

AVERY, John.—(*A communication.*)—" Improvements in bon-" nets and other coverings for the head." In these bonnets the " covered iron wire or bonnet wire " used in the ordinary construction is altogether or in part dispensed with by the employment of " a steel or other metal spring or suitable springy or " elastic substance," covered with " cotton, silk, or other suitable " material." Sometimes rolls of woven fabric " having some " degree of stiffness and elasticity " are used " minus the spring " or springy materials," but it is preferred " to use the springy " and flexible materials in combination." Slight springs or strips of springy or elastic material may " traverse the front or " other part of the bonnet shape either " for support or to give or " preserve elasticity."

" To secure a nice fit " elastic strings or bands may be placed " where the bonnet binds around the head or in any part where " required for the purpose ;" by preference the elastic is connected to " strings inside the bonnet and by which it is tied on the " head." A piece of elastic material placed at the back of the bonnet will cause the same to " fit various sizes of heads."

This " principle of construction " is equally applicable to other coverings for the head " with slight modifications."

[Printed, 4*d*. No Drawings.]

A.D. 1856, August 22.—N° 1963.

JAY, Samuel, and SMITH, George.—(*Provisional protection only.*)—" Improvements in ornamenting or trimming articles of " outer attire, such as dresses, mantles, bonnets, and the like." These articles are ornamented or trimmed with enameled or coloured leather, or with imitation leather, suitable to the colour of the material of which the article is made.

[Painted, 4*d*. No Drawings.]

A.D. 1856, September 6.—Nº 2078.

HARDING, Gustavus Palmer.—(*Provisional protection only.*) —" Improvements in the manufacture of hats and other coverings " for the head, and of parts thereof." Velvet bonnets, cloth and velvet hats, and other coverings for the head (for either men's or women's wear), and sometimes parts of such articles are made " without stitching or sewing, by blocking the cloth or velvet " into any desired form and then cementing it on to a shape " corresponding to the form on which the cloth or velvet was " blocked." To render the article waterproof a waterproof cement is used, or the material is previously waterproofed.

The inventor does not limit himself to any particular method of manufacture but he considers the following advantageous and desires " to secure the same." He uses steam for blocking the piece of cloth or velvet. The cloth is placed on the block "in a " wet state," and a heated iron is passed over it; the velvet is placed over steam until it is rendered sufficiently elastic to stretch to the form of the block. The fabric is then taken off the block and is put on a shape corresponding to the form of the block and previously coated with a mixture of gelatine and starch or other adhesive composition. The portions of the fabric not required to form the bonnet or hat are then removed.

The shapes are of "a light unvarnished material and are of the " description known as milliners' shapes."

Parts of bonnets and hats may be made as above described, and " be made up into a complete article by the addition of portions " otherwise made."

[Printed, 4*d*. No Drawings.]

A.D. 1856, September 19.—Nº 2204.

DAWES, George.—(*Provisional protection only.*)—" Improve- " ments in the manufacture of hats," giving elasticity to the inner part, causing the hat to bear more " uniformly on the " head," improving the ventilation, and preventing grease from penetrating through.

"A ring of horsehair or other stiff elastic fabric" is placed under the leather; it is " doubled over upon itself," and where doubled " is sewn all round to the edge of the hat." The elasticity of the ring "gives softness to the inside;" air is able to pass freely in through the horsehair round the edge and to pass out through perforations in the crown; grease is prevented from penetrating through the hat "by the lining being kept at a "distance from the inside."

[Printed, 4*d*. No Drawings.]

A.D. 1856, September 23.—N° 2225.

TAYLOR, JOHN GEORGE. — "Improvements in fastenings, "connectors, and couplings, and in the application thereof." The improvement consists in combining springs and hooks with rings, cords, chains, eyelet holes, &c. The fastenings are applicable for guards to hats, watches, purses, &c., and as a means of uniting garters and parts of garments. One kind of spring is intended to be used as "a button fastening."

The spring is composed of two pieces of metal; one part forming the rim or frame is "arched" at the top, bent inwards at the bottom of the arch, then widening outwards, round at the bottom, and divided with a slanting cut near the lower end; the other is a spring riveted to the frame and tending to keep the cut closed.

The hook is blunt at the outer end; the other end carries a "swivel top," and "a loose ring" works in the top, "and when "placed over the end of the hook makes it fast."

The spring for a button fastening is made "of one piece of "metal" bent into a somewhat similar shape to the one before described.

According to the article to which the fastening is to be applied, a ring or a cord, or a chain is fastened to the spring or the hook, and a ring is fastened to the other end of the cord or chain. Purses require to have an eyelet hole made in them.

"Brooch tongues" are fastened by fixing to the brooch "a "bead or other piece of metal perforated," through which the tongue "is thust, then bent down;" this bending "fastens the "tongue and gives the requisite spring."

Chains are made by fastening the links together with "double-"headed pieces of metal."

[Printed, 10*d*. Drawings.]

A.D. 1856, September 23.—N° 2229.

HUSBAND, RICHARD.—"Improvements in the manufacture "of silk hats." The first improvement consists in proofing with solutions of shellac either short or long lengths of calico or other woven fabrics by means of "the stiffening mangle;" the second in drying shellac proofed woven fabrics by means of "the steam "drying apparatus;" the third in putting a gloss or finish upon shellac proofed fabrics by means of "cold friction;" the fourth in making up hat bodies so that the hats "will not require "lining."

1. "The nethermost roller" in the mangle (a machine "well "known in the cotton manufacture") has one of its pivots prolonged to the outside of the frame and there fitted with a pulley. "Under the heavy rollers and parallel to them" is a trough having a roller suspended in it and containing shellac proofing solution sufficient to wholly or partially cover the roller. The fabric is conducted through bars in front of the mangle (the last "has diagonal slots on its face for the purpose of removing "creases") down to the solution "to be passed under the proofing "roller;" it is then guided upward and "has its initiatory end "placed evenly along the side of the lower large roller." The turning strap being applied to the pulley, the mangle draws the fabric round the roller in the trough between the pressing rollers and winds it "upon a cloth beam" or delivers it for drying.

2. The apparatus is the one "used in several branches of the "cotton manufacture." The drying of the fabric is effected "by "causing it to pass over and under the revolving cylinders from "a cloth beam or other suitable arrangement at one end of the "series to a cloth beam or other suitable receiver at the other "end."

3. "The friction calender, a machine well known in the stiffening and finishing branches of the cotton manufacture," is used. It is only necessary to mention that "for the purposes of the "present invention" the upper cylinder must be kept cold.

4. "A piece of dimensions suitable for a body foundation" is cut from the stiffened and glazed fabric; "the rough surface" is sponged sparingly; it is then divided "into tip and side," and blocked carefully "with its smooth face inwards." "The side "must not overlap upon the tip; the tip must overlap and be "ironed down to the side around the margin of the square." The other materials to make the body of the required strength and to complete it are added "according to the usual practice," but "*in placing* the fold rest upon the foundation it is necessary

" to avoid letting wet penetrate to the interior surface of the " body."

The patentee describes also his process of manufacture when " it is intended to have only the side of the body as above and to " have the internal surface of the tip faced with material that " is unproofed."

[Printed, 4*d.* No Drawings.]

A.D. 1856, September 30.—N° 2287.

JAY, SAMUEL, and SMITH, GEORGE.—(*Provisional protection only.*)—" A new material to be employed in the manufacture of " bonnets, hoods, hats, or caps."

The material is the hair of "the angola or angora." The hair is removed from the skin of the animal "by any of the known " means" and is afterwards interwoven "with an elastic woven " or looped fabric of any suitable material" according to the description of article to which it is to be applied.

[Printed, 4*d.* No Drawings.]

A.D. 1856, November 3.—N° 2578.

MIDDLETON, SAMUEL.—" Improvements in the manufacture " of certain articles of leather without seams." Amongst the seamless articles mentioned are helmets, sailor's hats, bayonet scabbards, the entire "upper and fore part and back" of a boot or shoe and "the legs of Wellington boots."

The patentee gives in his provisional and final specifications a full description of the machines by any of which these articles may be shaped; the principle of each is "exerting pressure upon " lasts or forms acting upon pieces of leather and made to pass " therewith through plates or dies of metal," causing thereby a flat piece of leather to assume and retain the external shape of such last or form.

One machine is worked like a screw press; three screws are employed and plates having openings therein for the passage of the leather and last. The upper plate has countersunk holes formed in it which come opposite to the points of the outer screws. The leather, "simply tanned but not curried," softened "with " water and oatmeal," and rubbed with "treacle," is secured between the plates, and the last (inverted) is placed under the middle screw and forced with the leather through the openings.

In another machine a "hexagonal shaped" casting is fixed on an axle. Metal plates with openings therein are pinned or screwed to the axle. Other plates with like openings in them and moved up and down by weighted levers hold fast the leather between the plates. The last or shape with the leather is forced through the openings by the rotation of a cam which presses on a rod. More than one article may be formed at a time by the employment of as many cams as there are openings in the plates. Racks may be used instead of cams.

The manufacture described is chiefly that of boots and shoes and scabbards. Respecting helmets and sailors' hats, "I proceed," says the patentee, "in a similar manner to that before described with reference to the manufacture of boots and shoes, using tools of suitable shape, and damping the leather."

Legs of Wellington boots are made from the skins of the legs of oxen and other large animals, tanned and prepared as above stated; they are shaped by the aid of mandrels which "have gentle rotatory motion imparted thereto" and of "instruments suitably formed for the purpose."

[Printed, 2*s*. 2*d*. Drawings.]

A.D. 1856, November 12.—N° 2669.

BROOMAN, Richard Archibald.—(*A communication from F. Durand.*)—(*Provisional protection only.*) — "A new or improved felted fabric." The "fleece or cardings" from the carding machine are placed in layers one over another, until a "web or sort of wad of the desired thickness is obtained." The wad is pressed between rollers, and "the layers and filaments" are united by sewing. The whole is then "fulled or felted and finished in the usual manner."

"Seamless fabrics" may be manufactured "by cutting out the parts from the web after the layers" have been united, by stitching the parts together "with threads of carded wool," and by "fulling the fabric," when the threads "will be fulled in with the cloth, and an apparently seamless article produced."

For hats, caps, shoes, and other articles "a canvas back" may be added to the fabric; "a nap or pile" may be stitched thereon; and the whole may be fulled or felted.

[*Printed*, 4*d*. No Drawings.]

A.D. 1856, December 13.—N° 2964.

BRAUN, Louis.—(*Provisional protection only.*)—" Improvements " in caps and such like articles." This invention relates to those parts of caps, &c. which " are usually stiffened." Instead of using " continuous strips or other forms " of stiffening material the inventor puts into " cells or pockets " (formed in the fabric of which the article is made by stitching) " a series of small pieces " of suitable material " with either " rounded or square corners, " or of other suitable form according to the part to which the " stiffening has to be applied." These pieces " have the upper " corners rounded off, or they may be bevelled, or the tops may " be semicircular," &c.

For the peak of a cap the pieces are of a length suited " to the " depth and shape of the peak," and for the crown they are taper and placed " within radial lines drawn from the centre."

The advantage claimed is that articles thus made " may be " folded and packed into the smallest compass without injury " to any part.

[Printed, 4*d.* No Drawings.]

1857.

A.D. 1857, January 8.—N° 64.

GOODMAN, Julius, MYERS, Abraham, and GOODMAN, Louis.—" Improvements in the manufacture of caps or coverings " for the head." This invention relates particularly to " military " foraging caps," and " the peculiar feature of novelty " consists in " permanently combining a waterproof or other reversible " covering with the cloth cover of the cap."

The front half " of the top and band part " is covered with cloth ; the other half is formed of oil-skin and cloth " connected " together and of such size as to cover the entire surface of the " cap." One half of this back part " is fixed to the foundation " or head lining," the other half is moveable and " fastened by " buttons and loops of elastic material to the band of the cap at " each side." When the oil-skin is to be exposed, the moveable portion is unfastened, " brought over the front part of the top " and band," and again fastened by the buttons.

An ornamental band "made in two parts" is affixed to the cloth "at the front and back parts" of the cap, and it is proposed to fix a ventilator at opposite sides of the cap, leaving openings in the lining at such parts.

[Printed, 6*d*. Drawing.]

A.D. 1857, January 26.—N° 228.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Messieurs De Clermont and Company.*)—"Improvements in the "preparation of woollen hats, bonnets, and bodies for hats and "bonnets." This invention "refers to that part of the preparation "which immediately precedes fulling;" it consists in combining with the carding machine "a double cone upon which the web "as it comes from the card is received and wound," and in arrangements of machinery "for imparting at the same time "rotary and oscillating motions to the double cone."

After the winding the web is divided at the base common to both cones, and the material for two bodies is obtained.

The arrangement of the machinery is of the following description:—To the axle of a cylinder (over which the web passes after being subjected to the carding machine) is connected a pulley which imparts motion by its strap to another pulley below it. The latter communicates motion to a shaft carrying two bevel wheels which are in gear with other shafts, pinions, and wheels (all fully explained in the specification). To the periphery of the last wheel in the series is fixed a rod connected to a bar; to the bar is connected a piece carrying two arms whereon are mounted four cones. The bar communicates to the piece and the cones "an oscillating movement every time that end of the rod which "is fixed to the wheel comes to the extremities of the diameter" of the wheel. The double cone being carried by the four cones "thus receives a corresponding motion." The rotary motion of the double cone is produced simply by its contact with the other cones, whose mode of revolution is described in the Specification.

[Printed, 10*d*. Drawing.]

A.D. 1857, January 29.—N° 264.

JAY, SAMUEL, and SMITH, GEORGE.—(*Provisional protection only.*)—"*An improved* hood or covering for the head, capable of

" being used either separate from or in combination with other garments " such as cloaks, mantles, capes, dressing gowns, and other " entire or partial coverings for the human body." The inventors call their hood "a mechanical hood;" it may be made by " connecting thin pieces or strips of metal or other material together;" " it is capable of "being expanded or collapsed " readily;" it may be used "either as a partial or as an entire " covering to be passed over the head when necessary without " resting thereon and capable of being fixed in any desired " position." The hood may be so formed that "when raised it " shall resemble an Elizabethan collar" and so protect the back of the neck and head from draughts, &c.

[Printed, *4d.* No Drawings.]

A.D. 1857, February 9.—N° 369.

TURNER, Charles, and WATERMANN, Louis.—"Improvements " in or applicable to the class of hats made from straw, " grass, palm leaf, or other like materials." These hats are " made to acquire the requisite oval shape to fit the head" without "altering the *contour* of the hat when put upon the " head."

In the first place they are shaped and finished by "steaming " and blocking" like felt hats.

Secondly, "a stiff curled edging formed of gossamer or other " suitable stiff material" is applied to the brim.

Thirdly, "a coating of hatters' proofing" is given "to the " under side of the brim and inside of the top and side of the " crown."

Fourthly, the edging is covered with a silk or other binding " which is sewed on to the edge previous to being curled over."

If further support or stiffness is required, the under side of the brim is covered with "a layer of silk, cloth, or other fabric."

[Printed, *4d.* No Drawings.]

A.D. 1857, February 20.—N° 498.

CROOK, John Rowland.—"An improved material for and an " improvement in the manufacture of hat tips, which material is " also applicable to the manufacture of hat and other boxes or " cases." The material consists of "one, two, or more thicknesses " of cotton or other textile fabric stiffened by shellac or

" other suitable stiffening agents and then japanned, painted, " coloured, or varnished."

The fabric is strained and fitted over forms of the shape and size of the top of the hat on which the finished tip is to be fitted or of the shape and size of the intended hat case.

The advantage claimed is the production "at a very much " reduced price" of a "waterproof tip, as efficient as a leather " tip, lighter, and more neat in appearance."

[Printed, 4*d*. No Drawings.]

A.D. 1857, March 5.—Nº 642.

BARDIN, Jean Louis Frédéric.—" A new mode of orna- " mentation." The patentee applies " the thin elastic skin, " pellicle, or cuticle of natural feathers or quills" to the manufacture of ornamental head dresses or other attire for women, of artificial flowers, of hatters' articles, &c.

The pellicles are stript off either by hand or by machinery, and the removal will be the easier if the quills are soaked in water or softened in any manner. The pellicles obtained from either the stalk or the barrel of the quill "are very flexible, and offer at the " same time a brilliant glossy appearance;" they may be divided into threads, be coloured in any manner, and be used alone or in combination with other threads, or with tapes, wires, &c.

[Printed, 4*d*. No Drawings.]

A.D. 1857, March 14.—Nº 726. (* *)

COWPER, Charles.—(*A communication from Abraham Micoud.*) —(*Provisional protection only.*)—" Improvements in the manu- " facture of artificial leather, or a substitute for leather." A fabric of wool, cotton, or other fibrous material is prepared in the following manner, "so as to present a smooth surface" on the face, and "a soft surface" on the back :—A composition of rye or other flour, baked and mixed with Spanish white or whiting and linseed oil, with or without the addition of coloring matter, is spread upon the face. The surface is polished and covered with one or more coats of paint or coloring matter, mixed with boiled or drying oils and thinned with oil of turpentine, and it is again polished and varnished if required. The back is coated (once or oftener) with an adhesive composition made either of " *boiled oil*, in a syrupy state, mixed and ground with ceruse

" or white lead and thinned with oil of turpentine," or of "a " solution of glue or gum, or gutta percha, or caoutchouc, or " other adhesive material;" the surface is then "covered with " powder or dust of wool, cotton, silk, leather, or other suitable " material;" it is allowed to dry, and the loose particles are then brushed off. Such a substance is adapted for making hats and hat shades, and for "other purposes for which leather is employed."

[Printed, 4*d*. No Drawings.]

A.D. 1857, March 25.—N° 840.

ALLAIRE, Simon Martin.—"Improvements in manufacturing hats, caps, and bonnets." This invention "relates to the " manufacture of shapes or bodies" for all kinds of coverings for the head; it is described with reference to a hat body.

The material used is a "knitted web cotton tissue or other " elastic and strong weavable fibrous material;" it may be woven (1) "in the form of a flat surface and in a single piece;" (2) " cylindrical and of a single piece;" (3) cylindrical and "formed " of three pieces joined together."

1. The material is cut out into shape, steeped in a solution of gum lac, "moulded in suitable metallic moulds," and stove dried. The crown, body or side, and brim are united in the same line by " gumming the two selvages." The operations which give the shape to the different parts of the hat "are performed with " metallic moulds slightly heated." The brim is strengthened " by a stronger web" (one knitted with three threads) or by a sheet of carded cotton "gummed on each side" and felted.

2. The crown or tip "is formed of four triangular pieces" joined together "by being woven or knitted by the machine, or " by hand, or by gumming."

3. A foundation is cut out ("slanting or on the cross") of a piece of fine elastic material; it is "furnished with an edge nearly " half an inch wide intended to form a collar;" then "a slanting " side or body of the same size" is cut out, and both are prepared with dissolved gum lac. These are placed "on a metal last," taking care that "the collar or edge of the crown is suitably folded " down on the exterior of the side or body." The circular web, steeped in gum lac preparation and put on the foregoing, "forms " the crown and side of a single piece." The hat body is then

stove dried, and "when it is dry it is turned inside out on its "metal last," and the collar is "gummed and inserted between "the knitted web and the band;" this turning however "is not "indispensable." The brim consists of "two strong cloths pre-"pared with gum lac dissolved" and gauze or light cloth gummed on both sides thereof; it is shaped by means of a heated metallic mould, and is joined to the body by leaving on it "an edge stand-"ing up nearly half an inch wide."

[Printed, 8*d*. Drawing.]

A.D. 1857, March 31.—N° 890. (* *)

WRIGHT, Josiah.—(*A communication.*)—(*Provisional protection only.*)—"An improved method of bleaching straw plait and "straw." "First soak the fibre or plait in a bath saturated with "soda of commerce and chloride of lime. The proportions should "be two of soda to one of chloride of lime by weight. The soaking "should continue for from about 24 to 72 hours. When removed "from the bath the plait or fibre is rinced in cold water and dried. "After being dry the plait or fibre is exposed in a closed chamber "to the fumes of sulphur, or to sulphurous acid gas, for from "about one to six hours."

[Printed, 4*d*. No Drawings.]

A.D. 1857, April 2.—N° 914.

HUSBAND, Richard.—(*Provisional protection only.*)—"Im-"provements in the manufacture of hats and other coverings for "the head, and in the instruments employed in the said manu-"facture." The improvements are (1) the substitution of iron or other metal for wood in blocks; (2) making blocks hollow; (3) applying heat inside the blocks; (4) making blocks so that parts "will adhere to each other without external pressure;" (5) employing such blocks "in new and old processes in making up "bodies for and in finishing hats and other coverings for the "head."

[Printed, 4*d*. No Drawings.]

A.D. 1857, May 20.—N° 1425.

TOZER, James Honiball.—(*Provisional protection only.*)—"Improvements applicable to travelling caps and other coverings "*for the head.*" The inventor attaches to caps "an air cushion

" or cushions" so as to form "an elastic pad" to protect the head from concussion, and to allow the head to rest "against the sides " of railway or other carriages."

[Printed, 4*d*. No Drawings.]

A.D. 1857, May 23.—N° 1454.

DUPLAIS, Noel Joseph Hyppolite.—(*Provisional protection only.*)—" Improvements in the manufacture of felt hats and " bonnets." These articles are made of a linen or cotton fabric and "wool or cotton shearings." The fabric doubled and glued together is moistened and shaped upon a heated metal block. When the shape is dry, it is coated with cleansed linseed or other suitable oil, and dried in a stove heated to about 167° Faht. When dried, it receives a second coating and is again dried in the stove at a temperature of about 189° Faht.; it is afterwards rubbed with pumice-stone to remove any roughness.

The inside of the shape is now coated with a mordant (whose base is "boiled oil, or oil deprived of its grease, added to a little " white lead or other known animal, vegetable, or mineral sicca- " tive") and then with woollen or cotton shearings, "at the " same time striking the other side of the hat with a rod to fix the " shearings." The stove for drying is now heated to about 212° Faht." and when the hat is withdrawn therefrom the same process " is recommenced for the exterior." The hat is then put again into the stove (at the same heat) "to obtain a perfect drying and " the complete disinfection of the oil." The final process is to " submit the hat to the vapour of hot water."

[Printed, 4*d*. No Drawings.]

A.D. 1857, June 15.—N° 1668.

VERO, Charles, and EVERITT, James.—" Improvements in " the manufacture of hats and other coverings for the head, and " in machinery or apparatus to be employed in the said manufac- " ture." The first and second improvements relate to the manufacture of hats, &c.

1. A body of fine material (with which the hat is to be finished) is laid upon a coarser woollen body previously basined into shape; the two are then basined together " in the ordinary manner." Or a fine body is put on a coarser body (which has been partially planked) "with water and a brush," and "the planking process"

is proceeded with. The fine body must be extended "to the "underside of the rim" of a hat and "to the interior of the "front" of a bonnet generally.

2. A layer of waterproof composition is spread over "the layer "of shellac or other agent employed for giving rigidity to the hat "body," the said layer "being immediately beneath the finished "surface of the hat body."

The third and fourth improvements relate to the machinery employed.

1. "The instruments called basins" are heated by steam. The basin is covered by a plate of metal considerably larger than the top of the basin. One pipe supplies steam to the basin, another carries off the waste steam, &c. The plate is heated at the middle by the basin, "the heat spreading in a lower degree all round the middle "portion."

2. Moulds are employed, consisting each of a convex mould and an upper and a lower plate with a circular opening in each. The lower plate is placed upon the basin; the convex mould stands in the circular opening; a hat body (previously steamed) is put upon the mould; the upper plate "is dropped over the "convex mould;" the plates are fastened together by hooks and pins or other means, and the edge of the body is held firmly between the plates and "prevented from contracting." The hat body is kept warm by the basin and gradually shrinks until it assumes the form of the mould. The mould and plates admit of slight modifications.

[Printed, 8*d*. Drawing.]

A.D. 1857, June 25.—N° 1791.

BOURNE, STEPHEN.—(*Provisional protection only.*)—"An im-"provement in the manufacture of felted fabrics." This invention consists in combining "silk cotton (which grows in the West "Indies and other hot countries)" with "wool, fur, and other "animal fibre," and in causing such combinations to be felted into fabrics suitable for making hats, &c.

[Printed, 4*d*. No Drawings.]

A.D. 1857, July 9.—N° 1908.

DE CLERVILLE, JOHN JULIUS CLÉRO.—(*A communication from Felix Abate.*)—"Improvements in the manufacture of oilcloth and

" imitation leather." Among the purposes to which the patentee applies his invention are imitating woven straw for ladies' bonnets and children's hats, hats, caps, shakos, waterproof gaiters, imitation leather for boots and shoes, and clothing. He describes several processes.

1. He makes a "transparent oily ground" upon a dyed or printed fabric by means of three or four coatings of "clarified " linseed oil" previously made drying "by boiling it with metallic " oxides." He smooths the surface with pumicestone, and then coats it with a hard varnish containing "a small quantity of " Prussian blue for black articles," and with "copal varnish for " all colored articles." If the coatings are to remain on the surface of the fabric without penetrating it, he prepares the fabric by first giving it one or two coatings of mucilage.

To imitate woven straw he passes the oilcloth between rollers, one of which has "engraved negatively on its surface" the intended pattern; or he embosses the oilcloth by means of a copper plate; or he lays on the oilcloth "a piece of the stuff which he " intends to imitate" and passes the whole between rollers.

2. He burns off "the surface wool or nap of the cloth," calenders the cloth, applies the oily coating, varnishes, and again calenders with hot rollers.

3. He makes the oily coating "upon a surface different from " that on which it is required," and transfers and fixes it upon the latter. The oily coating is made upon a cloth stretched on a frame and previously covered "with a paste coating." When the oily coating is dry, it is separated from the cloth by wetting the cloth from underneath; it is then laid on the surface on which it is to remain and is fixed thereto "by keeping the article for a little " while in a stove and by rolling it between moderately hot " rollers."

He colours oilcloth "by means of dry powders of any kind;" these he spreads with a sieve upon the last coating before it is quite dry, and finishes off by calendering. Sometimes he uses " ground wool or silk" as colouring powder; sometimes he prints upon his oilcloth "with dyeing or oil colours."

[Printed, 4*d*. No Drawings.]

A.D. 1857, July 14.—N° 1959.

HARDING, GUSTAVUS PALMER.—" Improvements in the manu- " facture of hats, caps, and other coverings for the head." These articles made of "cloth, velvet, plush, or other similar materials," after being dressed with a solution of some adhesive matter, are stamped into form between a heated matrix and a heated plunger. The edges are held in a state of tension " to prevent the formation " of puckers " while the plunger is being forced into the matrix. The article is thus formed from " one piece of fabric without any " joining," and when taken out of the matrix " will only require " trimming." A lining " may be stamped up with the cloth at " the same operation."

The matrix or form is hollow, shaped according to the article to be produced, kept heated by means of a steam pipe, and secured to a table. The plunger is hollow, heated by steam admitted through a flexible pipe, bolted to a plate affixed to a threaded shaft, and worked through a nut in a crosshead which is driven by a hand lever.

A waterproof solution may be applied to dress the material of which the article is made, or it may be used to cause adhesion between the lining and the body. The matrix may be engraved with any pattern or device. Taps are provided for letting off any surplus steam, &c.

[Printed, 6*d*. Drawing.]

A.D. 1857, July 15.—N° 1965.

QUICK, John Henry.—(*Provisional protection only.*)—" An " improved hat," made by combining " an elastic band and brim " with a crown of any of the ordinary materials of which covered " hat bodies are made."

The band and brim are formed of " plaited straw, grass, split " cane, whalebone, horsehair, or other similar and suitable sub- " stance ;" they are united to the crown by any of the ordinary compositions or varnishes. The edge of the brim is stiffened by overlaying or binding it with prepared calico. The body thus formed may be encased with any of the fabrics used for covering hat bodies.

This hat " by reason of its elasticity is capable of yielding " without undue pressure and adapting itself to the varied forms " of the human head."

[Printed, 4*d*. No Drawings.]

A.D. 1857, July 15.—N° 1967.

BROOMAN, Richard Archibald.—(*A communication from Monsieur Laporte.*)—(*Provisional protection only.*)—" Improve-

" ments in the manufacture of hats, bonnets, and other coverings " for the head." The sides of a block are covered with a fabric saturated with a composition of "gum lac and spirit of wine " heated in a bain marie." A crown of similar fabric "saturated " with a light composition" is "brought down just over the " edges of the body;" the edges of the crown "are thinned off." A brim of like fabric is united to the body by a strip of like fabric.

When the whole is dry it is taken off the block and coated with a composition made by boiling down about 100 parts (by weight) of linseed oil to from one quarter to one half its weight, and adding thereto gradually and while the oil is kept stirred about 20 lbs. of finely powdered white lead. This pasty composition is to be rubbed down on a slab "as in the grinding or rubbing down " of colours." Sometimes a second coating is required "to render " it perfectly smooth."

The body thus prepared is "taken in the left hand;" a rod is taken in the right hand; the body is held under a sieve, "from " which is shaken wool, cotton, or other suitable material in a " state of powder;" the rod is applied to the body; and the body is shaken for the purpose of securing an even adhesion of the powder all over the outside. The hat after being stove dried "is " ready for the trimmer."

Any colour can be given to the hat by varying the colour of the powder. For a black hat a composition of lamp black, linseed oil, and water acidulated with hydrochloric acid, should be added to the composition above-described.

[Printed, 4*d*. No Drawings.]

A.D. 1857, August 4.—N° 2106.

BIRCH, Richard, and **BRADBURY**, Robert.—(*Provisional protection only.*)—" Improvements in machinery and apparatus " for clearing and mixing hatters' furs." The fur is passed between feeding rollers and is then acted upon by a beater carrying eight or other suitable number of blades of different widths. By this means a current of air is produced sufficient "to impel " the fur through partitions in a chamber," whence it is forced into another chamber and is there deposited in a state fit for use. The partitions in the first chamber are covered with cloth "to " catch the kemps or coarse hairs," and "the blood lumps or " other heavy impurities are prevented passing along with the fur " by the angles in the air passages." In order to vary the amount of clearing, "the spaces between the ends of the partitions are "furnished with dampers," by opening and closing which "the "fur may be conveyed between a greater or less number of the "partitions."

[Printed, 4*d*. No Drawings.]

A.D. 1857, August 11.—N° 2147.

HUSBAND, RICHARD.—(*Provisional protection only*.)—"An "improvement in the manufacture of hats." The improvement relates to the construction of such hats as have "bodies composed "partly of paper," and its object is to prevent the paper from cracking and splitting.

The paper is not joined to the proofed calico until the latter has been stretched, dried, and blocked, preferentially, when it "has received the rough form of a hat body." A "finishing "shell" and a block are inserted into the body, and the "well "understood distensive pressure drives home the paper into close "union with the surrounding proofed material." The body is then ironed up; the block and shell are taken out; and the paper remains unimpaired and firmly secured.

[Printed, 4*d*. No Drawings.]

A.D. 1857, August 20.—N° 2213.

SPILL, GEORGE.—(*Provisional protection only*.)—"Improve-"ments in treating fabrics employed in the manufacture of hats, "caps, and bonnets, and for other purposes, and also other "fabrics, so as to render the same impervious to moisture and "grease." India-rubber or gutta percha is dissolved to a pasty consistence in coal-tar naptha or other solvent; powdered sulphur is added to the solution; and the mixture is spread in a thin film "upon the fabric forming the coating of the hat, cap, or bonnet." The fabric is then subjected to a high temperature "sufficient to "change the nature of the compound and prevent its decom-"position by its contact with grease," and at the same time "to "cause it to retain its permanent elasticity." The heat "may "be obtained in the application of the fabric to the hat or bonnet "or even afterwards."

Sometimes bees'-wax dissolved by heat or a solution of gelatine is used as a coating, and afterwards an "infusion of nutgalls" is applied.

[*Printed, 4d.* No Drawings.]

A.D. 1857, September 16.—N° 2405.

GARRARD, Robert.—(*Provisional protection only.*)—"Improvements in the manufacture of japanned straw hats." These hats are covered "with one entire piece of woven material "without seam or join of any kind," and the cover is afterwards japanned so as to render the same waterproof.

[Printed, 4*d*. No Drawings.]

A.D. 1857, September 23.—N° 2464.

OURY, Pierre.—(*Provisional protection only.*)—"An improved "apparatus and method for impressing or marking figures or "designs upon silk, cotton, or other suitable substances employed "for lining caps, hats, and other similar articles."

The inventor employs "an apparatus similar to any ordinary "stamping press." The bed of the press is provided with a metal plate "having in relief upon its face" the intended design. The under side of the plate is heated by means of small gas jets. The presser plate is worked by "an ordinary screw" and handle. The fabric to be stamped is prepared (when requisite) by immersion into "a solution of gum or other suitable substance" before it is placed upon the heated plate.

[Printed, 4*d*. No Drawings.]

A.D. 1857, September 28.—N° 2493.

BOWLER, William.—"Improvements in the manufacture of "hats and other coverings for the head." These hats, &c. are especially "suitable for hot climates." The body is made of a larger size than is necessary to fit the head. Inside and fixed to the lower edge of the body is a ring, and a band, by preference from one to two inches deep and fitting the head, is fixed to the ring or forms part of it. The ring "may project beyond the "body" and form a brim all round or only round part of the body.

[Printed, 4*d*. No Drawings.]

A.D. 1857, November 17.—N° 2884.

BROOMAN, Richard Archibald.—(*A communication from Luce Villiard.*)—"The manufacture upon circular frames of a "fabric suitable for petticoats and other garments, and curtains

" and other articles of furniture, together with apparatus to be " employed therein." In addition to the articles mentioned in the title, "caps, gimps, sleeves, &c," may be manufactured by means of this invention.

In order to produce a fabric " with alternately open work and " plain and close work to form the band, stripe, or sheath," several means may be adopted. (1) " One or more needles may " be removed from the needle bed; (2) " one or more needle " barbs may be closed;" (3) " a presser wheel may be so divided " as to produce at given intervals open work and plain, or close " stripes or bands."

To work upon a circular frame " with two loop wheels," the patentee retains " one only with its presser;" the presser wheel of the other " answers as a pattern wheel, the divisions in which " produce the open and the plain or close work." If the frame has four loop wheels, he retains three and replaces the fourth by a pattern wheel. He works " by alternating," that is, by making a portion of close work with the loop wheels, and then three or four rows of open work with the pattern wheel. If there are six loop wheels he retains four, and substitutes two pattern wheels for the other two; he can then " work without alternating, that " is, without raising at intervals the two pattern wheels." When the fabric is removed from the frame, " it is split in the direction " of its length, and divided transversely according to the fulness " required."

The invention includes also the manufacture on circular frames of " petticoats in which the loops are carried over":—For this purpose, the patentee applies an apparatus to the frame consisting " chiefly of two wheels;" one is " furnished with projections," each " hollowed out to receive a needle as it revolves;" the other is formed " with curved or hooked teeth, each of which takes hold " of and moves a needle as it revolves." The latter wheel is placed " above the needle like a presser wheel over their barbs," the former " under the needles near the sinkers," the projections corresponding in their distance apart to the teeth on the upper wheel.

" The several forms of apparatus" and their actions are fully described in the specification.

[Printed, 8*d*. Drawing.]

1858.

A.D. 1858, January 23.—N° 126.

SAMWELLS, John, JONES, Charles Henry, and PICKARD, Christopher.—(*Provisional protection only.*)—"Im-" provements in blocking and shaping hats, bonnets, and other " coverings for the head." The inventors propose to block and shape hats, &c. by the aid of moulds or blocks "placed the one " inside and the other outside" the article. These moulds or blocks (one or both) are heated by steam or any other well-known means, and pressure is applied to them "by any convenient " arrangement of press." Sometimes it will be found requisite to make one or both of the moulds or blocks in two or more pieces.

[Printed, 4*d*. No Drawings.]

A.D. 1858, January 23.—N° 128.

JOHNSTON, James.—"Improvements in bonnets, caps, and " other coverings for the head." This invention relates to the application of hair-cloth "for the construction of foundations, " shapes, or crowns" for the above-mentioned articles.

The hair-cloth may either be made entirely of hair or be woven up with "cotton, linen, or other threads or materials," and the fabric "is blocked to form in the usual or in any other convenient " way," after which it "may be treated and covered for use in " the ordinary way."

The patentee asserts that "head coverings produced in this " way" are "highly elastic and extremely durable," that they " admit of free ventilation directly through them," and "fit to " the head in a very superior way."

[Printed, 4*d*. No Drawings.]

A.D. 1858, January 26.—N° 140.

NEWTON, William Edward.—(*A communication.*)—"A new " or improved fabric intended principally as a substitute for " leather." This substitute is applicable for caps, cap fronts, and soles of boots and shoes;" it consists of cotton or other fibrous substance, "either woven into cloth or in an unwoven

" state," saturated and coated with a compound of linseed oil and burnt umber.

The compound is prepared by boiling about 3 lbs. of umber in 1 gallon of oil gently for from 12 to 24 hours until the compound " when cool will roll in the hands without sticking;" it requires frequent stirring during the boiling.

To prepare a fabric for caps and cap fronts a sheet of cotton is spread on a hollow table heated by steam and is coated first on one side and then on the other with the compound, the heat of the table causing the cotton to absorb a great portion of the compound. A heavy metal roller is then passed over it, or it may be removed and pressed between rollers; after this it is cured in a drying room heated from 100° to 130° Faht. and is ready for enameling if required.

" Sole leather or other stout leather " is made by uniting (by means of pressure) sheets of "cotton batting" saturated and coated with the compound; the curing is effected as beforementioned.

[Printed, *4d.* No Drawings.]

A.D. 1858, January 29.—N° 161.

HAMMOND, Edward.—" The manufacture of cap fronts, and " applicable to the manufacture of ruches, ribbon trimmings, and " other articles of millinery." For the manufacture of these articles the patentee employs a machine of the following description:—" Two slabs of metal" rest upon ends; the upper slab is attached to the ends; the lower one is moveable in a slide by means of a handle and cams upon a rod. The upper slab has attached to its under side " at the depth of five-eighths of an inch " a bottom composed of a slip of metal" which works freely in a groove in the lower slab. A knife working in grooves in uprights is suspended from a cross piece by means of elastic bands.

The band for a cap front " composed of stiff bobbin net" is prepared " in the usual way, its edges being slightly moistened " with water or with a weak solution of gum;" it is placed within the groove " and between two slips of zinc." " A length of " double blond joining, previously goffered, is then placed over " the groove" and between gauges. The knife is then pressed down by hand, " carrying with it the blond to the depth of one-" eighth of an inch into the groove." The handle is now raised, *thereby closing* the groove and " tightly compressing and uniting

" the band and the inserted blond." The knife is then lifted up by its suspenders, the groove is opened by depressing the handle, " and the finished article is removed into a tray to dry."

[Printed, 8*d*. Drawings.]

A.D. 1858, February 20.—N° 336.

MYERS, Abraham.—(*Provisional protection only*.)—" Improve- " ments in the manufacture of caps or coverings for the head." This invention consists in attaching a covering (waterproof or not) to a cap in such manner that the covering " is entirely con- " cealed from view when not required to be in use."

The covering " is attached to the edge of the back part of the " lining of the cap ;" and between the band and the cloth of the cap " a pocket is formed " to contain the covering when not in use.

The covering when required is " drawn forward over the cap."

[Printed, 4*d*. No Drawings.]

A.D. 1858, March 6.—N° 449.

WHEATCROFT, Samuel.—" The manufacture of cap fronts, " and applicable to the manufacture of ruches and ribbon trim- " mings. The machine for this manufacture is composed of (1) three metal slabs with polished surfaces " resting and moving " freely " upon ends; (2) grooves between the slabs, each fur- nished " with two slips of metal resting obliquely against the sides " of the grooves and retained in their places by four elastic " bands ;" (3) a wheel and handle " attached to a screw passing " through bearings connected with the under sides " of the slabs; (4) heat boxes parallel to and of equal length with the grooves, each traversed by a length of perforated gas tubing; (5) a knife suspended by elastic bands from hooks, and moving in slots in uprights; (6) rods along which the uprights move so as to bring the knife over either of the grooves; (7) a moveable gauge on each side of each groove. The screw is made " in three sections, " whereof the two extremes have the thread cut in a direction " contrary to that of the middle one," so that the turn of the wheel which will open the upper groove " will at the same instant " close the other below."

A band of " highly dressed bobbin net," folded in the usual way and wetted with water or a weak solution of adhesive matter, is placed within one of the grooves. A length of double blond joining (previously goffered) is placed over the groove and between the gauges. The uprights are moved along the rods until the knife is exactly over the groove, when it is pressed down into the groove by hand. "By this action the knife carries the goffered "blond into the band." The groove is closed by turning the wheel, and the band and the blond are "tightly compressed and "united." The knife is moved until it is brought over the other groove, "with which the same process is repeated." While this is being done, "the work in the first groove is sufficiently dry to "be removed," and "the work is thus continued alternately and "without interruption."

[Printed, 8*d*. Drawings.]

A.D. 1858, April 3.—Nº 709.

TRESS, Cooper.—"Improvements in or applicable to the class "of hats made from palm leaf, grass, chip, tuscan, leghorn, "panama, straw, and other like materials." This invention is intended "to give strength and firmness to the crown and brim "of the hat and to enable the hat to keep its shape."

The hat is blocked and shaped in the usual way. At the lower part "where the crown and brim unite," a band (one or more) is applied "inside, outside, or both, and brought over, on, or under "the brim." The band is made by preference of cotton cloth; it is "saturated with elastic varnish made from boiled oils, turps, "and a mixture of gums, spirits, et cetera, or a solution of shellac "in spirits;" it is secured by means of heated irons or steam, and when dry a coating of hatters' proofing or varnish is added. "Any other stiff or stiffening materials may be used for the "purpose."

[Printed, 4*d*. No Drawings.]

A.D. 1858, April 7.—Nº 742.

HAINES, Frederick.—(*Provisional protection only.*)—"The "application of manufactured india-rubber (as a substitute for "whalebone, steel ribs, and other such articles) to various parts "of ladies' dress." The inventor uses manufactured india-rubber "of any necessary consistency, thickness, and elasticity" for every purpose to which whalebone or steel is applicable in connection with ladies' dress. He uses it therefore in making bonnet shapes, stays, corsets, hoops for skirts, crinoline, and other like articles.

[Printed, 4*d*. No Drawings.]

A.D. 1858, April 17.—N° 847.

LATHAM, William.—" Improvements in the manufacture of " hats and caps." To obtain ventilation within a hat or cap, the body, just above the upper edge of the ordinary band around the part which fits the head, is made of larger diameter all or partly round, and is perforated with holes. That the outer surface of the band may not be of materially less diameter than the part of the body immediately above, it is thickened where it surrounds the head with a band of cork, leaving a groove just above the band, where air enters into the body through perforations. The ventilation may be at the sides only, or at the back and front only. At the upper part of the hat or cap there is an opening for the passage away of air.

[Printed, 6*d*. Drawing.]

A.D. 1858, May 4.—N° 990.

MORRISON, William Henry.—" Improvements in means or " apparatus employed in the manufacture of bonnet and cap " fronts, rouches, and such like articles of millinery." The improvements relate " to means of folding goffered or fluted lace or " net, and for the application to the back or folded part thereof " of bands or tapes."

The band or tape, gummed or otherwise cemented, is placed over a groove in a table, and between a pair of sliding bars, in position for the edge of a presser knife to descend and give a crease or fold thereto. Above the bars are two sliding plates, which, as soon as " the tape is correctly laid over the groove," approach each other, and " prevent the tape rising with the knife." The lace is " placed on this pair of sliding plates, and between " other adjustable bars," which act as gauges, and " lay the lace " uniformly over " the tape. The knife again descends, and causes the lace " to be folded with the outer edges projecting " uniformly upwards, and the folded edge to come on to " the tape, while the sliding bars " pinch between them the lace or net " thus folded, with the band or tape thereon." The knife then rises out of the way, and the bars "are again caused to pinch "the band or tape on to the folded edge of the lace or net."

The knife descends either by hand or by a treadle; "it is borne "with a tendency upwards" by elastic springs. The sliding bars are caused to approach each other by means of a separate treadle; they are kept apart by springs, and "their lower ends "are capable of being acted upon by a cam or tappets." The sliding plates have a tendency to approach each other by means of springs; they are drawn apart by a separate treadle. The adjustable bars "have a tendency to separate from each other" by means of a spring; they are drawn towards each other by a separate treadle.

The connections of the various parts of the machine are described in the Specification.

[Printed, 1*s*. Drawings.]

A.D. 1858, May 17.—N° 1095.

TOMBS, EDWARD.—(*Provisional protection only.*)—"Improvements in the manufacture of ruche and other trimmings for "ladies' apparel, applicable also to making cap fronts and other "fluted fabrics." These articles are made by machinery. "The "two pieces of ribbon or other material to be made into a ruche "or other trimming" are taken up under guide rollers on a table "between two other rollers, which are affixed to the standards or "framework" of four larger rollers, and where "jets of steam "impinge on them." The top or narrow length of ribbon and the lower or wider "are kept separate, and passed under upper "and lower rollers." The ribbons having been damped, "are "conducted through rollers placed in a framework or standard," and corrugated or fluted in a manner similar to ordinary goffering rollers.

"An important feature" of this invention consists in making the under rollers "recessed or grooved in the middle," and the upper rollers "in the corresponding part convex or rounded," so as to press the ribbon into them, "and to cause therein indentations "for the reception of the gummed string."

The ribbons pass out under guide rollers "to a point where "they meet with lengths of gummed string, which are brought "up by any mechanical action under two rollers" from a pot containing adhesive matter, and the string attaches itself "on

" coming into contact." The ribbons and string "pass on to a " drum or cylinder, on the periphery of which the smaller or " upper ribbon is made to press on the lower ribbon, and so to " cohere." The drum is heated by gas or other means, for the purpose of drying the material, which when taken off the drum is ready for use. The drum "has a reciprocating or excentric " action given to it, in order to prevent the overlapping of the " ruche."

[Printed, *4d.* No Drawings.]

A.D. 1858, May 22.—N° 1153.

PARKE, George Frederick, and BRIANT, James.—(*Provisional protection only.*)—"Improvements in bonnets." The body of the bonnet is composed of four pieces, two forming "the " head piece" and two the sides; the former are cut of such shape that when united "they retain the form represented" in the annexed sheet of drawings; the latter "are cut of a " form to correspond," and are attached to the former, "so " as to splay or set as also represented." Two other pieces "form " the curtain of the bonnet;" these may be shaped to suit the taste of the wearer. The body may be wired or otherwise strengthened, and trimmed or ornamented as required. The several parts may be made of any material, "and may be sub- " divided into smaller pieces if necessary."

[Printed, *6d.* Drawing.]

A.D. 1858, June 8.—N° 1286. (* *)

WAPPENSTEIN, Rudolph.—"Improvements in the manu- " facture of artificial whalebone, applicable to umbrellas, parasols, " stays, hats, bonnets, reeds, crinolines, and other similar pur- " poses."

The patentee says,—"I take the horns of animals, and cut " them spirally, either by hand or suitable machinery, to any " required breadth or dimensions; I then open or untwist the " said spiral so cut, and submit it to the necessary pressure to " flatten it, by which process I obtain a length of artificial whale- " bone, varying with the size of the horn, and the width of the " spiral cut, the said artificial whalebone being applicable to the " manufacture of umbrellas, parasols, stays, hats, bonnets, reeds,

" crinolines, shuttles, pickers, scabbards for swords, and other " similar purposes."

[Printed, 4*d*. No Drawings.]

A.D. 1858, June 9.—N° 1301.

GRIMSHAW, Edward Clark.—" Improvements in furnaces " and steam boilers." A stove for heating irons for hat finishing is combined with a steam boiler, the steam from which is used for felting or making hat bodies.

On the outside of the stove are flat surfaces for heating irons; they " may be covered with plates, so as to form one or more " hollow chambers or ovens for the purpose of heating pressing " irons." The stove is connected to a flue " in the interior of an " outer boiler," and in the flue is " an inner boiler having " an " internal flue." The smoke and heated gases pass from the stove along the outer flue, " turn at the back " into the inner flue, and thence pass to a " combustion chamber " of fire bricks or other materials. The inner flue is connected by an opening with the chimney. The outer and the inner boiler are connected by pipes, " so as to maintain through both boilers a constant " circulation of the water."

The outside casing of the outer boiler may be made of single plates or of double plates, " the grain of the plates being placed " transversely with each other."

Dampers (one or more) allow the stove to be used separate from the boiler or conjoined with it. Two drawings in the annexed sheet show " the employment of one damper;" when open it allows the smoke, &c. to pass through the inner flue and opening into the chimney; when closed the smoke, &c. circulates through other flues before arriving at the chimney.

Instead of a combustion chamber an iron plate may be placed " at or between the top or bottom in the centre of the flues, just " behind the furnace, so that the plate becomes sufficiently heated " to ignite the gases and consume the smoke."

[Printed, 10*d*. Drawing.]

A.D. 1858, June 17.—N° 1369.

MARSDEN, Joseph Henry.—(*Provisional protection only.*)— " Improvements in the manufacture of hats." These hats are *made with* a body of straw, grass, chip, palm leaf, or other similar substance, and with a brim of felt, gossamer, or other suitable material. "By this combination," says the inventor, "hats "combining great durability with lightness may be produced."

[Printed, 4*d*. No Drawings.]

A.D. 1858, June 23.—N° 1416.

VERO, Charles, and EVERITT, James.—"Improvements in "the manufacture of hats." The first part of this invention consists in applying brims of felt or of gossamer covered with flock to hat bodies of "any vegetable material plaited after the manner "of straw." The brim may be stiffened with "the well-known "stiffening materials called spirit or common proofing or glue," or it may be left unstiffened; it is afterwards dyed, steamed, and finished by the ordinary processes. The brim by preference extends about an inch and half into the interior of the body for the purpose of strengthening and protecting the part which comes into contact with the head. The brim is attached to the body by a solution of shellac or india-rubber and by stitching.

The second part consists in making hat bodies of straw, chip, and other similar substances, tips and brims of felt or gossamer, and in covering the whole with silk or woven fabric. The straw body is steamed into shape and ironed up. A flexible waterproofing solution (one or more coatings according to circumstances) is applied to the exterior of the body, then a spirit varnish, and, finally, an oil varnish. The covering of silk is put on in the ordinary method.

[Printed, 4*d*. No Drawings.]

A.D. 1858, August 6.—N° 1790.

BARTHÉLEMY, Carl.—(*Provisional protection only.*)—"Im-"provements in hats." The hats are made of felt or other similar material, and the improvement consists "in the application of "Japan varnish to the outside of the hat, which is thereby ren-"dered waterproof and is especially adapted for sea side or other "wear."

[Printed, 4*d*. No Drawings.]

A.D. 1858, August 14.—N° 1855.

CARTMEL, John.—"Improvements in the manufacture of hats, "caps, and other coverings for the head." The object of this invention is twofold, namely, to increase the flexibility of hats and caps, especially in the parts immediately surrounding the head, and to render the body and brim impervious to grease and perspiration.

The body and brim are made "of a linen or cloth prepared, " saturated, or coated with a preparation of caoutchouc" called " by the manufacturers sincalor." The cloth so prepared is lined with a piece of linen which is caused to adhere by dissolved shellac or an equivalent; or if a stouter body is required, the cloth is put between two pieces of linen.

The body and brim "are made up and manufactured into a hat " in the usual manner," the claim being limited "to the exclu- " sive use of the combination of the sincalored cloth with the " lining."

[Printed, 4*d*. No Drawings.]

A.D. 1858, August 17.—N° 1873.

JACKSON, JAMES, and FISHER, AARON.—(*Provisional protection only.*)—"An improvement in the manufacture of hats." The improvement consists in substituting "thin sheet steel or " copper, or such other metal or alloy as may combine the requisite " lightness and elasticity," for the materials at present in use for the bodies of hats and shakos.

The metal or alloy (galvanized or not) is to be coated with " gutta percha, red or white lead, or other pigment or substance " ordinarily used," and the outer covering may be "shoddy, " beaver, silk, or other material."

[Printed, 4*d*. No Drawings.]

A.D. 1858, August 24.—N° 1925.

BIGGS, JOHN.—"Improvements in the manufacture of caps " resembling in form the Turkish fez." The cap is knitted by machinery or hand, or partly by machinery and partly by hand, to the required shape. The yarn used is of wool or of other fibre containing "sufficient felting fibre to cause it to felt or mat when " milled after being knitted." The cap when knitted is "milled, " as is well understood," and by this means "a seamless cap is " formed resembling the Turkish fez."

[*Printed, 4d.* No Drawings.]

A.D. 1858, September 13.—N° 2077.

TURNER, Joshua.—" Improvements in the manufacture of " hats." To render hats lighter and more flexible and to increase their ventilation, the tip and brim are made of prepared grass or straw, or the article known as Brazilian chip or palm leaf. The side of the hat is manufactured of the ordinary materials. Or Brazilian chip or palm leaf is simply used to form a céntre, serving as a ventilator, the rest of the tip being of the same material as the side. Sometimes the grass, straw, chip, or palm leaf is wholly dispensed with in the tip, the entire body then being of the ordinary materials, but the brim will in every case be made of prepared grass or straw or of Brazilian chip or palm leaf. The hat is blocked and fashioned in the ordinary manner, and covered with black, white, or other colored silk plush or silk.

The under part of the brim is left uncovered.

[Printed, 4*d*. No Drawings.]

A.D. 1858, September 13.—N° 2078.

TOWELL, John William.—(*Provisional protection only.*)— " An improved helmet." The inventor professes to render helmets " lighter of construction and better adapted for deflecting the " heat or rays of the sun than hitherto."

He forms his helmet of two or more layers of cork united by intermediate layers of cloth coated with gum, shellac, or other suitable adhesive substance. He shapes the combined layers upon a block or mould, and in the head leather or lining he makes perforations " so arranged as to admit of air passing through the " same into the body of the helmet for the purpose of ventilation."

[Printed, 4*d*. No Drawings.]

A.D. 1858, September 30.—N° 2178. (* *)

KINSEY, Henry, **MORRISON**, William Henry, and **SMITHARD**, Samuel.—(*Provisional protection only.*)—" Improvements in means or apparatus for the purpose of folding " lace or other fabric, & also for cutting the same into lengths " adapted to be used in the manufacture of bonnet & cap fronts, & " for other purposes of millinery." In the manufacture of bands for caps or bonnet fronts the fabric employed is generally folded over at each edge towards the middle, "by which the thickness becomes "doubled, & such doubled fabric is then again folded, so as to "take in between the last fold the gofferings." The object of the improvements is an adaptation of mechanical means by which such folding may be more effectually obtained, and suitable lengths of such folded fabric may be cut therefrom, as the processes are completed. For this purpose, "one end of the "fabric to be folded is passed in between the parts of a plate or "trough, the sides or opposite edges of which gradually incline "towards or over one the other, with a tendency to cause the "edges of the fabric passed therethrough to fold in the direction "desired; and one end of the fabric having been passed into "such first folding means, it is thence taken hold of by rollers "in pairs, which act not only to draw the fabric through such "first folding means, but also to flatten or fully crease the "folded parts." In connection with rollers other rubbing surfaces may be employed, as may also steam or other heat. The fabric, thus folded with its two edges towards or over the centre thereof, is passed between other guides, having a tendency to cause it "to fold again in the middle, & through this second folding "means the fabric is drawn by other rollers to flatten it, & "through other flattening means, if desired, to produce a perfect "creasing to the fold obtained."

"There is also applied in connection with such folding means a cutting apparatus, "governed to act at intervals desired, so as "to cut the fabric into requisite lengths."

The inventors do not confine themselves to the order of folding mentioned or to the number of the folds or creases, as "they "may be varied, & bands, formed as explained, may be employed "for other purposes in millinery;" and in some cases "the "rollers for fully flattening the folds desired may be employed "only after the turning over or folding of all the parts is "obtained."

[Printed, 4*d*. No Drawings.]

A.D. 1858, March 22.—N° 2360.

WHITEHALL, Edwin.—(*Provisional protection only.*)—"Im"provements in machinery for the manufacture of cap fronts." This invention is claimed as an improvement on the one for which Letters Patent were granted to Edward Hammond, bearing date

January 29th, 1858, No. 161. The improvements have reference to the groove, the guides, and the knife.

The groove :—Two bars, each formed with an upright cheek in front, work on pivots. A bar "forming the bottom of the groove" is sustained "by lateral pins which work loosely in corresponding "perforations in the cheeks," and "an extension of the cheeks" overlaps the ends of the bar "thus terminating the groove at "each end." The groove is closed by depressing a lever, but space is allowed "for the zinc slips which are to enclose the band "of the cap." Plates cover up the groove after the slips have been placed in it "with the exception of a narrow slit just sufficient to admit of the descent of the knife"; they are supported by "rods working on pivots"; they are kept open by "inclines "formed by a projection in the upper part of the frame sides "against which an extension of them works"; and they close by means of springs, "the moment the groove is raised above "the top of the inclines."

The guides :—An oblong frame encloses two moveable bars "to "the bottoms of which a narrow strip of brass is attached." The bars move on screws by means of milled wheels. "At each end "of the frame there is a hole intended to pass over the corresponding pegs at the end of the groove." The goffered blond is placed upon the brass strips and between the bars.

The knife :—The descent is effected by the action of a treadle. The groove ascends and meets the knife. The groove is supported by rods which work through fixed bearings inside the frame sides of the machine, and the knife by rods whose bearings are outside. The rods are attached to the opposite arms of a lever, and the treadle is connected in such manner that the same movement brings down the knife and brings up the groove.

"Two operators are required, one at the front and one at the "back of the machine"; their duties are explained in the Specification.

[Printed, 6*d*. Drawing.]

A.D. 1858, October 28.—N° 2405.

RAILTON, TIMOTHY.—"Improvements in the apparatus employed in the manufacture of cap or bonnet fronts." One part of this invention consists in "making the holders of such a shape "that the centre of the front is lower than the two extremities,

" the front gradually increasing in width." By this means cap or bonnet fronts " of gradually increasing widths " may be produced. Of " the two outer " and " the two inner partitions of " the holders " one of each " is hinged to one of the bottom " plates ;" these plates " are also hinged together."

The other part consists " in making one side of the holder with " a hinged partition " at each end, so that the cap or bonnet front may be made " with three sides or rows of blond, net, or " other material."

The strips of blond previously goffered are placed in the holders ; the attendant then closes the holders and cuts off that part which " owing to the raised shapes of the holders projects " beyond the selvage required for securing the fabrics together." The closed holders are placed on a board ; the selvages are secured together " by placing a band or folded piece of net or other fabric " over them ;" a damp piece of muslin or other fabric " is then " laid thereon," and a hot iron is passed over it. The dressing in the blond " is thus caused to adhere together, thereby uniting " the selvages."

[Printed, 6*d*. Drawing.]

A.D. 1858, October 28.—N° 2410.

SMITH, James.—" Improved hats and coverings for the head." The patentee applies to hats and caps " the crinoline material " for which he obtained Letters Patent, dated October 22nd, 1857, No. 2699. The material is composed of a horse-hair weft and a flaxen warp.

The material is immersed in a solution of ½ lb. of alum, ½ lb. of gum arabic, and two gallons of water ; when dry it is immersed in a solution of ½ lb. of alum and 2 gallons of water, thereby rendering it " impervious to rain or nearly so." The brim is made of thicknesses of jaconet and calico stiffened with shellac and varnished with spirit varnish ; it is covered with the crinoline on the upper and with alpaca on the lower side, although other fabrics may be used.

No other foundation than the crinoline is needed, but for high-crowned hats buckram or other stiff material may be added. According to the description of hat the foundation is blocked and stiffened or cut to pattern and sewn together ; it may be covered with silk, plush, &c.

[Printed, 6d. Drawing.]

A.D. 1858, November 1.—N° 2430.

VERO, CHARLES, and EVERITT, JAMES.—" Improvements in " the manufacture of hats and other coverings for the head, a " part of which improvements is also applicable to the manu- " facture of felt." The first part of this invention relates to a method of making hats. The sliver of wool or mixture of wool and fur is put on to a roller somewhat larger in diameter than, and by preference two or three times as long as, the hat body to be made. The sliver is coiled upon the roller " in the form of a " hollow cylinder." The roller is moved by an under roller whereon it rests by its own weight, and the under roller is moved by gearing connected to a carding machine. The rollers have likewise " a sliding reciprocating motion in the line of their axes "; on the lower end of a lever a pin engages in a groove in a box-cam suitably mounted; on the upper end of the lever a pin engages between the flanges of a pulley on the axle of the lower roller; flanges on the ends of this roller communicate motion to the upper roller. The lower roller is heated by steam. As the sliver passes between the rollers, it is partly felted; the felting is promoted by damping the sliver. The upper roller is lifted off the machine; the cylinder of matted material is slipped off, is divided into lengths, and is then basined in the ordinary manner.

If stuff or fur is used, the felt body is put on a perforated cone; the air underneath is exhausted, and the fur is blown on. The body is then turned inside out and is put on a cone with a metal cap; fur is then blown on " for the under side of the rim." Or a flat piece of metal or wood may be placed in the cone " to prevent the fur blowing on what is to be the inside of the " hat."

The second part consists in waterproofing hats of palm leaf, chip, straw, &c. A solution of india-rubber or gutta percha is applied to the interior or exterior or to both.

The third relates to the manufacture of brims and peaks; they are made by cementing together layers of cork alternating with layers of felt, chip, plaited fibre, or textile fabric.

The fourth consists in applying brims of felt, or felt covered on the upper side with silk, to bodies made of gossamer and covered with silk.

The fifth, in covering helmets and head coverings of leather with felt or woven fabric by the aid of a flexible waterproofing *composition.*

The sixth, in covering hat bodies of wool with fine felt or woven fabric applied by means of a flexible cement.

The seventh, in covering hat bodies of palm leaf, chip, or plaited material, with a cover of felt or woven fabric partially or entirely adhering to the body.

[Printed, 8*d*. Drawing.]

A.D. 1858, November 17.—N° 2593.

WHEATCROFT, Samuel.—(*Provisional protection only.*)—"Improved apparatus for uniting lace to blond and other fabrics." This united fabric is employed mainly for the purpose "of making ladies' cap fronts."

The fabrics are passed over a narrow roller which is supplied with water; in their passage the edges become wet, and the stiffening matter with which they are dressed is dissolved. The fabrics then pass between metal guides "which have a lateral adjustment to suit different widths," and thence between pressing rollers "causing them to join with a width of lap that is determined by the adjustment of the guides." Beneath the rollers is a heating box, so that the rollers act as drying rollers and "deliver the joined fabric in a state fit for use." The rollers are all geared together so that the moistening, joining, and drying form one operation.

"To insert lace or other fabric into bands," the lace is goffered and placed in a machine "which will cause the creased band that "has been previously moistened to close upon it and adhere "firmly thereto." The machine consists of (1) an octagonal drum with a gas jet inside; (2) a fixed and a sliding bar on each face of the drum and extending nearly from end to end thereof; (3) a pair of coiled springs connected to each sliding bar for retaining it "in its normal position;" (4) a cam "which on being "turned will press up the sliding bar towards the fixed bar and "cause the two to nip any fabric that may be placed between "them." The method of working the machine is described in the Specification.

[Printed, 4*d*. No Drawings.]

A.D. 1858, November 18.—N° 2598.

RILEY, *Samuel*.—"Improvements in the manufacture of hats, "*bonnets*, and caps." The object of this invention is to render these articles, but more especially the bodies and brims of hats which are covered with silk or plush, "more elastic and thereby " more comfortable to the wearer."

When the hat is prepared and finished in the ordinary manner " ready for the trimmer, tipper, or finisher," the brim is slit (by preference at the back of the hat), and the slit is continued into the body to a depth of about two inches. The slit is bound round leaving it open at the outer edge of the brim, and some elastic material is applied either to the inside or outside of the hat, or between the slit, or between the layers of the material of which the hat is formed. The elastic preferred is vulcanized india-rubber, or cloth webbing, or silk india-rubber webbing " about " 4½ inches in depth, so as to extend over the brim or slit." After binding the raw edges with ribbon or galloon the elastic is by preference stitched " to the inside and underneath the brim of " the hat over the cut or slit." The leather is cut and fixed " so as to leave the elastic in the inside of the hat bare and " exposed to the head."

Additional ease may be imparted by placing a layer of thin vulcanized india-rubber under the leather at the front, and extra strength by putting " another layer of thin material between the " folds or on the outside of the inner fold " where the slit is made.

Where elasticity is required in any part of caps and bonnets, the same material is used, and a similar process is adopted.

[Printed, *6d.* Drawing.]

A.D. 1858, November 18.—N° 2608.

ARCHER, Elisha Thomas.—" Improvements in hat ventilators, " and for appliances connected therewith." A ventilator, to be inserted in the crown of hats, is formed of a piece of sheet brass, the body being dished to make a raised lip all round. The body part has an extended arm when first struck out, which is afterwards folded across, forming a bridge piece from the lip on the one side to the other. A part of the lip is notched and folded down on the loose end of the bridge piece to hold it in position. This bridge piece has a hole in the centre, into which a hollow socket piece is screwed in from the outside of the hat. The centre of the body part is perforated, and the under side has mounted on it a mother-of-pearl ring, ventilation taking place through the perforated body and the socket piece.

A spring clip for holding railway tickets or other cards is to be applied to the ventilator. The clip is made of steel, bent in the form of a loop, the one end of which passes through the raised edge and across the ventilator, where it is fastened by bending down a notched part of such edge, while the other end presses on the inner side of the ventilator, and clips anything inserted between them.

The clip may also be made to bear upon the centre of the ventilator, which is then made with side openings; or it may be held in a slightly different way, between a solid body piece (with a hole through the centre) and an extra thimble piece. In this case the clip bears on one side of the ventilator. The central thimble piece may be made with holes instead of being tubular for the passage of the air.

[Printed, 8*d*. Drawing.]

A.D. 1858, November 18.—N° 2609.

RIDER, BENJAMIN.—"Improvements in ventilating hats and " caps, and in the preparation or manufacture of the material of " which those articles are made." The hats are ventilated by perforating the bodies "either in the flat" or "after they are " formed," but before the application of the silk or other covering. The bodies are perforated by means of a stamping press which cuts a row of holes at each time. A net or other openwork fabric must be used for the lining.

The material of which the hat body is made is paper wherewith are combined (while in a state of pulp) "long fibres of any " fibrous material, or fibres of hair or threads, or it may be " ground cork, flock, or wool prepared for the purpose." The material may be introduced when the pulp is in sheets or before.

Or "a stringy fibrous-like structure" is formed in the body of the paper by expressing all or nearly all the moisture from the pulp and mixing with the pulp milk, malt liquor, wine lees, or any fluid "having a suitable proportion" of saccharine matter; a little oil should be added.

The hat bodies are made "as in the ordinary manufacture," or " in one or more pieces by casting them in moulds from the " pulp."

[Printed, 6*d*. Drawing.]

1859.

A.D. 1859, January 13.—N° 117.

WILSON, WILLIAM.—(*A communication from J. S. Taylor.*)—
" Improvements in machinery for felting bodies of hats and " bonnets." An iron cylinder lined with lead is supported at each end by an iron frame; it has covers at each end, a door in one side for access to the interior, and a hole for the escape of liquid. In each cover there is an aperture for the entrance and exit of the rolls to be felted. The cylinder contains four grooved wooden rollers so placed as to "cross each other." At one end the axles of the rollers pass through circular holes in the cover of the cylinder; at the other end the axles are brought closer together and pass through slotted holes in the cover. The upper two axles at the last mentioned end "are carried in bearings in a " rocking frame," the lower two "by bearings capable of " sliding lengthways " in boxes which are " capable of sliding in " guides on the cover." The lower two axles "are pressed up " to the ends of the boxes nearest to the centre of the cylinder " by springs," and the boxes "are set up by screws" to adjust the pressure of the springs. A shaft above the cylinder carries at one end a wheel, and a chain passes round the wheel and round wheels on the extremities of the roller axles; the tension of the chain is adjusted by means of pulleys "connected together by a " right and left-handed screw." The rocking frame is set in motion by a crank on the end of an axle which is in gear with the shaft. The shaft is driven at a speed of about 80 revolutions per minute.

The working of the machine is described in the specification, and "it is convenient," says the patentee, "to work these " machines in pairs."

[Printed, 10*d*. Drawing.]

A.D. 1859, January 21.—N° 196.

MORRISON, WILLIAM HENRY, and KINSEY, HENRY.—(*Provisional protection only.*)—" Improvements in means or appa" ratus employed in the manufacture of bonnet fronts, ruches, " ribbon trimmings, and other goffered or pleated articles." The improvements relate to means "for pressing the edges" of one or more rows of goffered lace or other fabric "so as to form a flat "edge on which a band may be applied."

Beneath each row of goffered fabric is introduced "a strip of "corrugated metal" or "a strip with a number of wires or other "divisions" to maintain the goffers in the desired position during the subsequent operations. The rows are forced into form by means of a gauge "worked by a treadle acting upon the outer "edges thereof," and are thence forced up to another gauge. "Pressing bars are then caused to act upon the material to "press and flatten it upon the edge."

If a band is to be applied, the material is removed "by means "of a pair of clamps holding it close to where the pressing bars "have acted upon it;" it is then laid "over a groove in which "the band has been previously placed," so that the edges upon which the bars have acted "may fall into the groove." The bars forming the groove "will then be acted upon by cams or other-"wise to close them, and thereby unite the band to the goffered "material."

The means described for maintaining the goffers in position "may be employed apart from this machine when working by "hand or otherwise."

[Printed, 4*d*. No Drawings.]

A.D. 1859, February 1.—N° 283.

EVELEIGH, Samuel Birchall.—"An improved form or con-"struction of hats or covering for the head." This hat, "de-"signed principally for the use or wear of police officers," combines the form of the military shako with the brimmed hat of the civilian.

The body or "head-room" is that of the shako, retiring in a slanting direction either from the forehead to the crown, or from the back of the head to the crown; the latter is preferred. The front is furnished with the peak of the shako, whilst the side and back brim is that of ordinary hats. The whole is made of black felt or other suitable material, and is provided with "strong "leather crown and side strips."

[Printed, 6*d*. Drawing.]

A.D. 1859, February 3.—N° 308. (* *)

WOODROW, Jeremiah.—(*Provisional protection only.*)—"Im-"*provements* in the manufacture of hats or coverings for the

" head." The improvements consist " in the novel application, " employment, or use of a woven fabric called ' Swiss tissue,' as " an external covering for the foundation or body of the hat, " such fabric (' Swiss tissue ') being composed of straw or other " material of similar character, interwoven either with yarns or " threads of silk, cotton, flax, or other fibrous material as a " groundwork, the straw being principally on the top or outer " surface of the cloth, and giving a glazed or straw-like appear- " ance to the hat, and with the advantage of being woven in " place of ' plaited,' as straw has hitherto been used."

[Printed, 4*d*. No Drawings.]

A.D. 1859, February 15.—N° 416.

ALDRICH, EDWARD HENRY.—(*Provisional protection only.*)— " Improvements in ladies' dress caps." The manufacture of these caps is simplified by securing the lace, &c. to the foundation " by the employment of cements or other adhesive substances " through the medium of heat and pressure by suitable blocks," and by attaching flowers or other ornamentation " by metallic " ties or fastenings."

[Printed, 4*d*. No Drawings.]

A.D. 1859, February 19.—N° 463.

WHEATCROFT, SAMUEL.—" Improvements in the method of " and the means for uniting lace to blond and other fabrics, and " also in the apparatus used for manufacturing or converting the " same into bonnet and cap fronts, rouches, and such like similar " articles of millinery."

1. A machine " for uniting lace to blond " :—At one end of a frame two reels are mounted; the lace is wound on the one (the " more elevated " one), the blond on the other. The fabrics pass from the reels over two tables, one of which has a guide " under " and into which the edge of the blond enters." The blond in its course has its edge moistened by a wet sponge. The fabrics next pass under a guide (having " a lateral adjustment ") by means of which the lace is " caused to overlap the adjoining edge " of the blond." The fabrics now come into contact and pass between hollow rollers heated by gas, hot water, or steam, thence over a drying plate on to a drum.

Guides "hold the material close to the tables." Breaks "regulate the pressure of the rollers." The sponge is placed "in the narrow end of a bent funnel;" or "a wheel continually wetted may revolve on the edge" of the blond. The gearing of the reels, rollers, and drum is described, and "various alterations, modifications, and substitutions may be adopted in the minor details."

2. A machine for "the uniting and insertion of the said lace and blond or other fabrics into bands";—"A hollow polygonal shaped drum, preferably octagonal on its outer periphery," is mounted on bearings and heated by gas, hot water, or steam. On each face of the drum, extending nearly from end to end and parallel to its axis, are two bars, one fixed, the other sliding; the latter is connected with a spring which "causes it to leave the fixed bar" after the action of a cam which forces it towards the fixed bar "so as to nip any thing between them." Over the drum rises "a cradle or tie-bar," from which is suspended "a knife or bar or box to be used according to the kind of fronts to be made."

"Hinged or free slips" are inserted between the bars, so that when the bars "are somewhat apart the slips form an angle;" they are made to open by "small weighted levers" and are kept in position by guides. There is a cam on each face of the drum "just behind the moveable bar." The carriage within which the box (containing the fabric) is placed slides up and down rods on the side frames by aid of pulleys and weights; the box "is of the usual form adopted for that purpose." Instead of the carriage and box "the suspended bar or knife may be adopted when thought requisite." The action of this machine with either the carriage and box or the bar or knife is fully explained in the Specification.

[Printed, 10*d*. Drawings.]

A.D. 1859, March 15.—N° 654.

RIDER, BENJAMIN.—"Improvements in hats, caps, and other coverings for the head, and in apparatus used in the manufacture of such articles." The improvements consist (1) in preparing the bodies of hats of two thicknesses of sheet cork, with an interposed fabric of net, and cementing the whole together; (2) in forming helmets of two thicknesses of felt, having an intervening space filled with cork dust or shavings; (3) in subjecting the crowns and brims of hats made in this way to hydraulic pressure or to rollers; (4) in perforating the linings of hat bodies in the form of lace or ornamental patterns, for ventilation or ornament, and applying ornamental lace for linings; (5) in making cap peaks of thicknesses of fabrics cemented together, the whole consolidated by hot pressure, and afterwards japanned and covered with leather, cloth, or silk; (6) in ironing up hat bodies with a mixture of gum dama and French chalk; and in applying chalk to the blocks to prevent the adhesion thereto of the hat bodies.

The improvements also consist in stiffening the bodies of hats by using saccharine matter such as milk, wine lees, or malt liquor with the shellac instead of water; in coating the leather linings of hats "either separately or in the skin" with silk, cotton, or willow, or with ground cork or flock, applying first a grease-proof composition (consisting of flour mixed with wine lees, malt liquor, and gutta percha or india-rubber), on which, when dry, a varnish is applied, the cork, &c. being then dusted on to it; and in forming hat bodies of a fabric to which is afterwards applied a coating of powdered cork.

The improvement with reference to the apparatus employed in hat making for stretching the fabrics consists in beveling the surface of the frames so that only a narrow edge is in contact with the material.

[Printed, 6*d*. Drawing.]

A.D. 1859, March 26.—N° 762.

REDGRAVE, William.—(*Letters Patent void for want of Final Specification.*)—"An improved pillow travelling cap." This cap is briefly described by the inventor as consisting of "a circular " tube or tubes made of any air-tight material" and as being made in every shape and material "that may be chosen." He recommends his cap for travellers by land or water, for women and children, and as "an excellent invention for lunatics."

[Printed, 4*d*. No Drawings.]

A.D. 1859, April 9.—N° 893.

MARTIN, John.—"Improvements in the materials used in the " manufacture of bonnet fronts and ruches." "A band of cotton " or linen tape or muslin or other cotton or linen woven fabrics " of a comparatively close texture" is applied in place of lace or net or other open character of fabric "to the back part or folded "edge of bonnet fronts and ruches," so that the part which comes "most into contact with the head" may have a smooth character and be more agreeable "to the touch."

Another improvement relates "to obtaining stiffness to the "back edge of machine-made bonnet fronts and ruches":—A strip of pasteboard or other stiffening substance (excepting wire) is introduced "within the band." Or the desired amount of stiffness may be obtained "by using a suitable sizing, gum, or "starch."

[Printed, 4*d*. No Drawings.]

A.D. 1859, April 14.—N 945.

BARNWELL, Stephen, and ROLLASON, Alexander.—"Improvements in the manufacture of umbrellas, parasols, hats "or hat covers, caps, capes, coats, mantles, dresses, gloves, and "other similar articles." These articles are covered with or made of a silk, cotton, worsted, or other woven fabric, which has been previously dressed or coated with "a preparation of collodion and "oil."

The solution is made by mixing together about 300 parts (by weight) of ether, 100 parts of spirits of wine, 30 parts of collodion, from 75 to 100 parts of vegetable oil, and as much colouring matter as may be required, adding mineral or animal oils "according to the rigidity or flexibility which the goods may be "required to possess." To produce "a great degree of stiffness," from 1 to 3 per cent. of any suitable gum, balsam, or resin must be added. The solution is allowed to evaporate "until it arrives "at such a density that it will only just flow evenly over a glass "plate, so as finally to leave a substantial film behind it."

Before the solution "is quite set" on the plate, the fabric is laid on, rolled over it, and immediately removed, "bringing away "with it a thin film" of the solution. The fabric thus coated is submitted to a heat of from 100° to 300° Faht., and the result is that "a slightly glazed appearance" is imparted to it, while at the same time it is "considerably strengthened or thickened."

In making hats, the ordinary plush is attached "before applying heat" to a body composed of or partly of the prepared fabrics. For summer hats or caps, a hat or cap body is covered *with prepared* sarcenet or other thin and light fabric. Some hats have a covering of sarcenet or other napless silk instead of plush. Others have a body made only of calico prepared as above, and a covering of thin silk.

[Printed, 4*d*. No Drawings.]

A.D. 1859, April 19.—N° 990.

MATTHEWS, John William.—(*Provisional protection only.*) —"An improvement in the manufacture of hats and other cover-" ings for the head." The object of this invention is the production of a flexible hat "having both the appearance and " advantages of the beaver hat, but without the use of that " expensive material the beaver fur."

The inventor proposes to form a felt body and "to cover the " same with the ordinary silk tissue." He unites these substances with "any suitable varnish or liquid cement," using the same when "not flexible" sparingly, so that it will not "impart " stiffness to the article coated." The hat may be lined, bound, and finished in the usual way.

[Printed, 4*d*. No Drawings.]

A.D. 1859, May 23.—N° 1265.

MASON, John Hutchinson, and BAXTER, George Lee.— " Ornamenting lace or other twisted fabrics," to be used in " manufacturing bonnet and cap fronts and ruches, and for other " purposes."

This invention "consists in using one or more threads to pro-" duce patterns or ornamentation in lace or other twisted fabrics, " where two or more colours in one thread are used."

Skeins of silk, cotton, or other substance, or "a whole piece of silk, lace, or other fabric are wrapped round with string or other suitable material at certain distances, "according to the number " of different colours that may be required on each." This wrapping preserves the part wrapped from the action of the dye into which the skeins or pieces are dipped. After the dipping, the skeins or pieces are hung up to dry; when dry, the string is unwound, and the skeins or pieces are ready for use, the unwrapped part being of the colour of the dye, the wrapped remaining "in the " same state and of the same colour" as it was before the dipping. By a like process more than two colours may be produced on the same skein or piece.

[Printed, 4*d*. No Drawings.]

A.D. 1859, May 30.—N° 1335.

MICKELTHWATE, Arthur, PEACE, Joseph, and HOBSON, Samuel Johnstone.—"Improvements in the coating and "covering of metallic springs, steel, iron, and other metal bands, "for the use of any kind of machinery, driving bands or straps, "ribs suitable for umbrellas and parasols, stay busks, and ribs for "stays, hats, bonnets, reeds and crinolines, and articles of dress "and other useful purposes." The springs and bands are coated with gutta percha, or with papier maché, paper pulp, vulcanized india-rubber, or other adhesive substance instead of gutta percha, or in combination with it. The springs or bands are heated, drawn through the adhesive substance, and then passed through gauges or rollers, "to give them a surface resembling whalebone." A thick coating of varnish or paint may be used instead of the foregoing, the object being to protect the metal from the action of the atmosphere, and render it a non-conductor of lightning.

Leather may be fastened on to the steel by means of the adhesive substance. Flock, shoddy, or velvet pile may be mixed with the adhesive substance, or be put on after the metal is coated; in such case the metal, when the adhesive substance has had time to cool, is again passed between rollers.

[Printed, 4*d.* No Drawings.]

A.D. 1859, June 2.—N° 1358.

PARKES, William Henry, and BAGNALL, William.—"Ventilator for hats and other head coverings, and also for carriages." In hats the ventilator is applied to the crown. A circular hole is pierced through the centre. Under the hole is a metal disc of somewhat larger diameter than the hole, having its upper side covered with the same material as the hat covering, and supported on the top of a screw which has a milled button on its lower end. The disc and screw are carried by a bracket through which the screw works, and the bracket is fixed in the crown by means of its pointed ends, the horizontal portions of the ends bearing against the interior surface of the crown. The required degree of ventilation is obtained by adjusting the disc at the proper distance from the hole. A sliding rod may be used instead of a screw.

[Printed, 8d. Drawing.]

A.D. 1859, June 4.—N° 1378.

WOOD, JAMES, and WOOD, WILLIAM.—(*Letters Patent void for want of Final Specifiation.*)—" Method of dyeing lace or " other fabrics, and making the same into bonnet and cap " fronts or other articles." The information given relates only to the preparation for dyeing. The lace or other fabric, arranged in such lengths or divisions as may be required, is wrapped round in cords and then dipped in dye liquid so as to obtain any colour required.

[Printed, 4*d*. No Drawings.]

A.D. 1859, June 14.—N° 1430.

SMITH, GEORGE.—" Improvements in hat bands." " The " main feature of novelty in this invention " consists in making a hat guard " a component part of the hat band," so that it cannot be lost or misplaced.

The hat band is a piece of ribbon or other material " sufficiently " long to go twice or more times round the hat ;" and to each end is affixed " a buckle or other suitable fastening or ornament." The portion which forms the band is held by the prongs of one buckle, and this buckle " is formed with a piece thereon " for the purpose of connecting the other to it.

The buckle at the end of the portion forming the guard is of the following construction :—At the outer end is a loop whereby it is hooked on to the projecting piece on the band buckle; near each end is an opening through which a piece of ribbon " is " passed double as a bow ;" and in the middle is a bar round which a piece of elastic is passed loosely and sewn at each end to the guard.

[Printed, 8*d*. Drawing.]

A.D. 1859, June 16.—N° 1440.

LEVY, SIMON.—" Improvements in hats, caps, or coverings for " the head." The improvements consist in constructing a head covering which " can be made to assume either the hat form or a " form somewhat similar to a travelling cap."

The article shewn in the sheet of drawings is supposed to be made of cloth, but it may be made of other substances, even of a stiff material provided that the brim part " be sufficiently flexible " to bend."

The brim is attached to the body on the front half, but on the hinder half "to a loose lining" which forms the hinder half lining "when in the hat form." The front half of the lining is secured to the body of the hat. "The loose half of the brim is " secured to the body of the hat when in the hat form by means " of three metallic hooks or catches fastened to the body part" and by a piece of elastic cord (with a button at each end) "which " passes through four holes in the brim." The cord is on the under side between the middle and end holes, but on the top side between the middle holes. The middle hook "is of the ordinary " description," the others are holders formed each "by a short " tube or ring with a narrow slit in front," through which the cord will pass, but not the button.

When the cord is hooked on to the middle hook and the buttons are fixed in the rings, the brim "is held properly in its place for " the hat form." When a change in form is required, the cord " is unfastened," and the brim "is brought to the front" and " passed under a cover on the under side of the brim." The cover is secured "to the front edge of the brim" and kept in place when in the hat form "by a hook upon the cover and an " eye on the brim;" the hook takes hold of the cord between the middle holes "when in the cap form, so that the brim part is " retained under the cover."

On each side (near the middle) there is a loop of elastic cord on the brim and a button on the body; when these are fastened together (the loose part of the brim having been brought to the front), "the brim will be properly held up at the sides in the cap " form;" and the loose lining "will only require to be pushed " forward towards the front of the body," when it will form "the " front half of the lining," a fixed lining being secured "on the " back half of the hat to correspond to the front half."

For flexible materials a metallic hoop "should be secured to the " lower part of the body." A jointed metal frame should be placed on the edge of the brim to keep it in form.

[Printed, 6*d*. Drawing.]

A.D. 1859, June 18.—N° 1471.

HARPER, Richard, **STOKES**, Robert, and **WALKER**, Thomas.—"Improvement in the manufacture of chenille, bonnet " *wreaths*, and bonnet feathers." For making chenille the patentees use an apparatus of the following description:—"Any "required length of a circular foundation made of either brass, "iron, wood, or other material," is placed between two supports or the opposite ends of a room, so that it can be held in a horizontal position. This foundation is made with two or more grooves running the whole length thereof, and a fine wire is placed in each groove. A tube or socket "actuated by means "of a band and wheel" slides upon the foundation; it has attached to it "a triangular or other shaped stud plate." The studs carry bobbins of silk or other fibre, and each bobbin is fitted with a flier to conduct the silk on to the foundation. When a circular motion is given to the tube, the material on the bobbins is wrapped upon the foundation. When the operation is completed to the length required, "a knife is inserted into one of "the grooves for the purpose of severing the silk directly over "it, and thus liberate the material" from the foundation. "A "small twisting apparatus is attached to the severed portion by "means of the wires previously inserted in the grooves," and the whole is twisted together, "forming a circular material or "chenille."

The tube with the apparatus for driving it is fixed on a carriage whose wheels run on a tramway, so that the tube can traverse the length of the foundation. The carriage supports a shaft turned by a handle. By means of a pulley on the shaft and the above-mentioned band and wheel, the tube is caused to revolve rapidly, while the carriage moves slowly on the rails by means of a band which connects another pulley on the shaft to a pulley on the axle of the wheels. The tube revolves between two sockets of a bracket carried by the carriage and provided with a bearer or guide "for steadying the wire and keeping it "perfectly central in the tube."

The twister is "a small apparatus consisting of a spur pinion "and wheel actuated by a handle."

The process of making chenille of different thicknesses, and of making different qualities, is described in the Specification.

For bonnet wreaths and bonnet feathers (where only short pieces of chenille are required), "the method of operating is "much the same," excepting that the foundation "may be caused "to revolve by means of the twister "whilst the silk is passed "along by hand."

[Printed, 8d. Drawing.]

A.D. 1859, June 20.—N° 1486. (* *)

CLARKSON, THOMAS CHARLES.—(*Provisional protection only.*) —"Improvements in the manufacture of boots, shoes, and other "articles." The inventor describes his improvements in the manufacture of a boot or shoe, adopting "a similar process" for making "shakos, helmets, and many other articles."

He places a sock or cushion on the bottom of a last, draws a stocking fabric over them, and coats the fabric with a solution of india-rubber or other cement. He then sticks a strip of leather of suitable width at the edge of the bottom of the last, and sheet cork to the fabric, "taking care to have [the cork "wrap over the bottom edge of the last." In some cases he puts thereon, either with or without strips of cork, layers of curled hair about one inch apart, then a layer of cork coated with the solution on both sides, and then a covering of thin calico. He next sticks on "thin sheet cork, of nearly the shape required "for what is termed by shoemakers the counter and side lining," of an extra thickness at the heel and round the edge near the bottom, and rasps off "the edge that stands up so as to make it "thin at the top." Sometimes he places strips of curled hair "between the first foundation and the second or third lamina or "layer," causing them to adhere by the solution. He coats the whole with solution, covers it with thin calico (which is brought "over the under edge" of the last) and if required adds "a "second thickness of cork." If a leather sole is required, it is fixed on with solution; the heel is affixed with either solution or screws. He turns and polishes the heel in a lath after it is fastened on. He sometimes introduces strips of wood across or along the sole between the layers to give "rigidity or thickness."

[Printed, 4*d*. No Drawings.]

A.D. 1859, July 1.—N° 1565. (* *)

BEARD, JAMES RAIT.—(*Provisional protection only.*)—"Manu-"facture of artificial whalebone, applicable to umbrellas, parasols, "stays, hats, bonnets, reeds, crinolines, and other similar pur-"poses."

This invention is an improvement on that described in two Specifications of Letters Patent granted to R. Wapperstein, dated respectively November 3rd, 1857, No. 2793, and June 8th, *1858, No. 1286.* It consists in "steeping the horn of animals in

" oil, or a composition of oil and other matters heated to the " requisite temperature until it is sufficiently soft. The horn is put into a mould heated by steam, after which a mandrel made of wood or metal is driven into the horn to straighten it, when it may cut spirally, as described in the last-named Specification.

[Printed, 4*d*. No Drawings.]

A.D. 1859, July 8.—N° 1621.

WAITE, William.—(*Provisional protection only.*)—" Manufacturing bonnets, hats, and other articles partly or entirely from " the leaves of the palm tree or other flat or thin material." The article is made " without plaiting or weaving." The leaves, &c. are cleansed, bleached, or dyed, cut into pieces of " proper shape " and size " (by preference from a half to three quarters of an inch at the widest part), bent as required, and joined together (by sewing or adhesive matter) in such manner that the second piece overlays the edge of the first, the third the edge of the second, and so on. The trimmings may be made of the same material.

The articles and trimmings may be made partly of the leaves, &c. and partly of velvet, silk, or other fabric.

[Printed, 4*d*. No Drawings.]

A.D, 1859, July 23.—N° 1722.

WHITEHALL, John Batkin, and WHEATCROFT, Samuel.—" Improvements in the construction of certain parts of the apparatus or machinery made use of for manufacturing bonnet " and cap fronts, rouches, and such like articles of millinery." Four heat boxes, forming two pairs and heated preferably by gas, are " supported on a side carriage " and oscillate on " gudgeon " extremities;" they are " of a conoidal prismoid or truncated " wedge-prism shape, open at the base, the one side forming a " larger angle with the top face than the other does." Teeth " gear into each other between each pair." A " pallet or pendant " is attached to or forms part of " a side of one box of each pair." Over the boxes are fixed plates. " In the space formed between " the upper surface of each pair " is a pair of slips. " A quick " motion screw " has one end terminating in a handle and on the other " *two pairs of* collars," the spindle between each pair " pass-

"ing through and working in the pallets." A knife suspended to a frame and mounted on guide spindles is connected to a treadle by "rods, levers, and cranks;" a coiled spring is "attached "to the same system of levers." The guide spindles are pin-jointed to "parallel motion links," so that by means of a handle the knife can be thrown from the one groove to the other and at the same time be "retained in a parallel and perpendicular position." On the same spindles are mounted "parallel guides" pinjointed to parallel rods, so that "the system forms a jointed "parallelogram."

A modification of the foregoing is described; *inter alia,* the heat boxes are "caused to rotate on their axes so as to open and "close at the top and thus form the grooves;" and "oscillating "covering plates" are used instead of fixed ones.

The subordinate parts employed and the method of working the machines are detailed in the Specification. The machines are rendered "in a great measure self-acting" by the addition of a driving shaft, "from which by means of cams, excentrics, levers, "toothed gear and straps, motion is transmitted to all the "different parts."

In some machines "the goffering machine" is appended and driven "from the same driving axle."

A machine "for the manufacture of graduated fronts" is composed principally of (1) one pair of boxes; (2) two grooves; (3) a knife "of a segmental or curved form;" (4) two bars, "placed "on each side of the knife and attached to the back," and "constructed to turn on their axes so as to open and shut when "required and thus grasp or set free any substance between "them;" (5) two blades fixed underneath the boxes "in such a "way as to form a pair of shears and to act when required by "means of a spring or other pressure;" (6) "covering plates." The action of this machine is described.

"In the manufacture of singles" the part "which has to be "inserted within the band" is kept straight, and the band is "put on evenly and straight," by forming the heat boxes "so "that one box, the fixed one, shall have a fixed blade or bar, "the upper or moveable compressing bar having a rotating or "moveable blade attached to it, and by means of a spring or "other pressure each time the bar is brought down the blade is "caused to oscillate and thus cut any substance placed between "the upper and lower blades."

An improvement "in those banding machines which have one " of the boxes or pressing bars moveable and the other fixed:"— Covering plates similar to those used in the first machine are fixed on the boxes; "the one plate will move with the moveable box," and the other remain fixed on the immovable box. The knife is carried "always with the moveable" box, so that, "when once " set centrically and parallel with the edges of the boxes," it will always remain so. This arrangement obviates "the difficulty of " getting the quilling properly or centrically inserted within the " band."

[Printed, 1*s*. Drawing.]

A.D. 1859, July 30.—N° 1771.

WILSON, ARTHUR BUSHBY.—(*Provisional protection only.*)— " Improvements in the manufacture of hats." The hat is made with a gossamer body, the innermost coating being "of black " calico" if preferred. The body is covered with a thin felt material of fine wool or of a mixture of fine wool and "coney " wool and hare's wool." This material "is fitted to the gossamer body," and "when firmly adhering" a nap is raised upon it by "drawing a card with extremely fine teeth across or over its " surface whilst in a state of moisture." The nap is laid from right to left by the application of hot irons "and damp and dry " velures."

"A wool or stuff, or wool and stuff hat body," may be used instead of a gossamer body.

[Printed, 4*d*. No Drawings.]

A.D. 1859, August 1.—N° 1775.

MOLLADY, JOHN.—"An improved form or construction of hat, " cap, or covering for the head." This article is a "combination " of the peculiar form of the Scotch cap or Highland bonnet " with the brim as of an ordinary hat only slightly different in " form or with a front peak only."

The body is made with the "overhanging crown," and "the " ordinary cap peak" is attached to the body. Apertures are made in the part below the crown, "through which the air passes " in and out at the top."

[Printed, 6*d*. Drawing.]

A.D. 1859, September 1.—N° 1993.

SIMPSON, John Anderson.—"Improvements applicable to "hats and other coverings for the head." Between the shell and ordinary head linings of hats and caps is introduced a padding of worsted or plush, the back of which is coated with india-rubber, "hatter's proofing," or varnish. Or oiled silk may be introduced at the back of the padding in place of, or in combination with, proofing the back of the padding itself.

Air-holes are formed through the sides of the hat in the position nearest to the temples when in use. These openings may be covered with a band of open fabric, and a portion of the elastic padding in the interior of the hat may be removed at that place. The heated air then passes away up through any hole in the upper part of the hat. The ventilating holes may also be made through the lower edge of the lining near the temples instead of through the body of the hat.

[Printed, *6d.* Drawing.]

A.D. 1859, September 7.—N° 2038.

DANN, Edward Robert, and GOLDSCHMIDT, Edward.—(*Letters Patent void for want of Final Specification.*)—"Improvements in the manufacture of bonnet fronts or lappets." One part of this invention consists in setting the goffered blond or net "into a band of paper," thereby combining smoothness and convenience with economy of manufacture. The paper may be strengthened "by introducing threads or strengthening bands "into it during the manufacture."

The second part consists in mounting the goffered blond, &c., "on a thin band of metal," which holds it firm and supports the bonnet.

[Printed, *4d.* No Drawings.]

A.D. 1859, September 9.—N° 2064.

NEWTON, Alfred Vincent.—(*A communication from Andrew Campbell.*)—"Improvements in the process of and machinery for "manufacturing hat bodies." The improvements are (1) "a "new combination of the feed motion, picking cylinder, and "perforated cone;" (2) forming a hat body with greater speed and at the same time picking the stock more effectually without rendering the feeding more troublesome; (3) distributing the fur or other stock upon the cone "to enable the manufacturer "to use short fur with advantage;" (4) hardening the bat sufficiently "to permit of its being removed from the cone with- "out the application of water," and facilitating the removal of the bat from the cone "without requiring the latter to be taken "from its position in the machine."

The upper portion of the frame, "upon which the picking "cylinder and the feed motion are mounted," is made separate from the lower and attached by hinges or pivots, so that the end at which the cylinder is situated can be adjusted to cones of different dimensions. The feed apron conveys the stock to a pair of feed rollers mounted immediately in front of the cylinder, and in order that the rollers "may gripe the fur more securely," the upper one should be pressed towards the lower one by springs or weights, and the barrels "should be slightly fluted." There are two picking cylinders, a main one and a secondary one immediately above the main one; they are studded with teeth and revolve in opposite directions; the journals of the secondary picker "are supported in a pair of adjustable cheeks." A guard "is inserted between the barrels of the cylinders and the upper "feed roller to prevent the fur from being accidentally passed "over the latter" to the former.

The perforated cone which receives the fur "forms one of a "series of three" which "project radially from a pyramidal" draught box. This box "is supported by a fan case;" it has "a collar plate" at its bottom, "which fits loosely upon a corresponding collar on the top of the fan case," so that the box with the cones on it "can be turned upon its axis to bring each cone "in succession to the proper position" to receive the fur from the cylinder. In order to hold the box stationary until a proper quantity of fur is collected upon a cone, "one of its corners is "engaged with a spring catch," on the top of the case. "The "circular space within the collar plates is open," and a circular opening is made in each face of the box behind the base of each cone to ensure a proper draught. Each cone "is made fast by "a rim at its face to a ring plate," which is "secured to a short "shaft that projects radially outward from the axis of the "draught box." The shafts are in gear with a shaft "which "passes through the hub of the draught box," extending upwards beyond the box and downward into the fan case where "it is

" fitted with a worm wheel to which motion is imparted by a " worm upon a horizontal shaft." The fan is "of the screw " variety;" it is situated at the mouth of a circular opening in a partition which crosses the fan case. The larger compartment communicates by the opening in the collar plates with the draught box, the smaller one "with an air trunk situated beneath the " floor of the factory." The axis of the draught box is inclined in order that the cones "may rapidly pass beneath the picking " cylinders," and the box itself is "set close to the picker " frame."

While one cone is in a position to receive the fur, a second is " in a proper position for the hardening of the coating of fur," which has collected upon it, and the third "in the proper position " for the removal of the bat." The hardening is effected "by " the combined action of pressure and motion." The pressure is imparted by means of a conical cover "which lies loosely upon " the bat," and has resting on it "a series of weighted rollers." A rapid reciprocating movement is imparted to the cover by means of a bar "which slides rapidly to and fro across the top" of the draught box. In order that the hardened bat may be readily removed from the perforated cone, "a blast of air is " forced through the cone into the interior of the bat."

The arrangements for obtaining the reciprocating movement and the blast of air, the method of connecting the various parts, and the working of the whole are explained at great length in the Specification.

[Printed, 1*s*. Drawing.]

A.D. 1859, September 12.—Nº 2078.

MORRISON, WILLIAM HENRY.—"Improvements in the manu- " facture of bonnet and cap fronts, and in the means or apparatus " employed therein." The improvements first described relate to goffering machines and consist in contrivances "by which to " measure or indicate the quantity of material being used," and in means "of heating the rods or bars of the goffering chains by " which the goffering is effected, and of steaming the gofferings."

The material passes from a creel between two rollers, the axle of one of which carries a screw wheel. The wheel gives motion to any one of a series of toothed wheels in connection with it. The teeth vary from each other so that the wheels "may take " longer or shorter time in rotation." The wheels turn upon axles carried by a plate which "is formed with a centre screw pin." The pin "passes through a slotted hole formed in the main "framing and is capable of being fixed therein as desired" by a thumb nut so as to hold a particular wheel in connection with the screw wheel. Each wheel carries pins which act at stated times upon one end of a "hammer lever," and the lever striking a bell indicates "that a certain quantity of fabric has passed "through the apparatus."

In addition to the "well understood" parts of the goffering machine steam boxes are applied by which "the required heat is "obtained to the rods or bars," and a perforated steam pipe whereby steam is admitted on to the fabric "just as it is beginning to be acted upon by the goffering bars."

The other improvements relates to "the banding machines;" they consist (1) "in forming the grooves open at the ends so that "the bands may be introduced endways and removed with the "gofferings attached thereto at the opposite end;" (2) in "cutting means to separate the banding (when used in a continuous "length) into the separate length for each goffering as it leaves "the banding machine;" (3) in "the adaptation of a series of "trays arranged to pass in two tiers" and "to come in succession into position with their gofferings;" (4) in arranging the nipping bars "that they may partially close upon the blond when "the knife descends in the groove to prevent the blond rising "with the knife;" (5) in giving to the various parts "rotary "motion."

1. "For this purpose the uprights in the way are bent or arched "or otherwise formed, so as to admit of the free passage of the "material."

2. The cutters are formed by two cutting surfaces "somewhat "of the character of scissors;" they are formed on levers which turn upon a stud, "and at their lower ends they are acted upon "with a tendency to close them and thereby effect a cutting at the "times desired" by means of cam or tappet surfaces on an axis "to which those parts are borne by means of springs."

3. Each tray is formed with adjustable sliding pieces and "with a pair of parallel slides," also "with parts," which "partly "embrace the rods," whereon they are supported, "with capabilty of sliding thereon" and upon other rods or bars. The "sliding motion" of the trays is fully described in the Specification.

4. The nipping bars are hollow for the introduction of steam; "they are supported each upon a pair of arms;" they are caused to approach each other "to pinch the band on to the gofferings "by means of levers," whose lower ends are acted upon by cam surfaces. The arrangement "in relation to the motions of the "other parts" is such that the bars effect the object before-mentioned. The bars are drawn back by means of springs.

5. The rotary motion is explained in the minute description of the whole machine given in the Specification.

[Printed, 2*s.* 4*d.* Drawings.]

A.D. 1859, September 16.—N° 2109.

NEWTON, WILLIAM EDWARD.—(*A communication from H. A. Burr.*)—"Improvements in machinery for forming hat bodies." The patentee dispenses "with the trunk for guiding the fur on to "the perforated cone," and "with the use of water to harden the "bat before removing it" from the cone.

The first part relates to directing and guiding the fur as it is thrown by the picker and to distributing it properly on to the exhausted cone; the second to the method of taking the bat off the cone and of holding the fibres together during the removal and the process of hardening.

1. A pinion on one of the rollers (round which the feed apron moves) engages a pinion on the end of one of a pair of feed rollers which present the fur to the action of the picker. The picker "is covered by a cap or casing;" it picks the fur from the rollers and throws it towards the perforated cone. The cone is made by preference "of perforated sheet copper strengthened "by a rim at the lower edge;" it is placed on a ring resting on the arms of a horizontal wheel whose periphery is grooved to receive a band from a pulley on the driving shaft, "by which it "is rotated with a slow motion." The wheel "is placed over a "hole in the top of a box," wherein is "an exhausting fan" in gear with a pulley on the driving shaft. The fan causes "a "current of air inwards through the perforations in the cone," and the fur deposited on the cone "is held until the required "thickness has been accumulated." At one side of the box is a pipe into which a current of air is forced by the fan; it has "a "vertical branch" (provided with a damper) which "extends "*upwards to* within a short distance of the bottom" of the

picker. To the mouth of the branch is hinged a spout, so that the blast of air therefrom, "which, striking the fur as it is thrown "by the picker, keeps it up and directs it on to the cone," can be elevated or depressed. Two similar pipes (each with a hinged spout) "branch off laterally, then turn up vertically, and then "curve forward," one on each side of the casing; the streams of air from these "carry along and guide the fur laterally to the "cone."

Two modifications are described; in the one the fan case is arranged over the feed rollers and apron; it has side tubes "for "retaining the air, so as to cause it to be discharged" through a "series of blow pipes." In the other the air pipes are connected with a steam boiler and "discharge currents of steam towards the "perforated cone."

2. A cap, "made of grass cloth" by preference," or of other flexible substance "pervious to air," is fitted on to the cone before blowing the fur on to it. "So soon as the required quantity "of fur has been deposited, and while the pressure of air is maintained by the exhausting fan," a cap of vulcanized india-rubber cloth (with the india-rubber surface inwards) is put over the bat. The whole is taken off the cone, "folded up and properly rubbed "to cause the fibres to interlock and thus harden." When the cap and cloth are removed, "the bat is then in a condition to be "carried through the after processes."

[Printed, 1*s*. Drawings.]

A.D. 1859, September 20.—N° 2144. (* *)

MATTHEWS, Leonard.—(*Provisional protection only.*)—"Improvements in machinery to be employed in introducing plain "or coloured wire upon lace or other fabrics for the purpose of "ornamenting the same, or for running and stiffening on caps, "cap borders, or for other similar purposes."

The inventor says,—"According to my present improvements "I propose to employ in the said machinery guides and springs "for preventing the twisting of the wire when being worked into "the lace or other fabric, either when manufactured with wire or "when wire is applied afterwards; and I also propose to employ "moveable directing bars, which serve to keep the fabric upon "which the wire is being worked in a proper position while being

" manufactured into caps, cap fronts, or other useful and orna-
" mental articles. These parts operate in conjunction with a
" groove and knife."

[Printed, 4*d*. No Drawings.]

A.D. 1859, October 19.—N° 2394.

HART, George.—" Improvements in the manufacture of hats." The improvements are intended to give a "degree of elasticity" to the "band or that part which comes into the closest contact " with the head."

The patentee forms the band of " a soft elastic yielding material, " such as felt, caoutchouc, or other suitable flexible material." The brim is made in two parts, the oval inside being "about " three-sixteenths of an inch larger all round than the size of " the head." A strip of the flexible material is fastened to the inner edge of the brim pieces "with a hot iron, varnish, cement, " or other suitable adhesive substance." The brim pieces are united by laying the one piece over the other and fastening the two together. The brim thus formed is affixed to the body "by " causing the upper or remaining part" of the flexible material to adhere (by any convenient means) to the body "either on the " outside or inside" or "between the stiff material" of which the body is made. "The part thus left uncovered" between the bottom edge of the body and the inner edge of the brim (" which " is about three-sixteenths of an inch in width") allows the band " to work freely and yield to any irregular shape of the head." The whole is now "ready to be covered in the usual way."

[Printed, 4*d*. No Drawings.]

A.D. 1859, October 19.—N° 2397. (* *)

WARNE, William, JAQUES, James Archibald, and FANSHAWE, John Americus.—" Improvements in the manufacture of elastic hoops or bands and other analogous elastic " articles applicable to various parts of ladies and gentlemen's " wearing apparel, and in the machinery employed in such manufacture." These hoops or bands are especially intended for petticoats and skirts, but "bands of this kind may also be used " as an edging for some parts of ladies' bonnets and of gentlemen's *" apparel."*

The hoops or bands are made of some woven fabric coated or saturated with a "preparation of caoutchouc and gutta percha "combined with any other suitable ingredient." Lengths of the prepared fabric are rolled up "spirally or longitudinally into the "form of either a round or oval cord or a flat or square band;" the ends are connected so as to form an endless band. The hoops or bands are vulcanized if desired in the usual manner. Or endless hoops or bands may be made of "solid gutta percha, with "which may be incorporated if desired some fibrous material or "other substance to give it increased strength."

The hoops or bands are put into a "covering machine, in which "they are covered with cord or wire or with any suitable fibrous "material." The principal parts of the machine are (1) one or more rotating discs or wheels provided with a central guide eye or tube to receive the hoop; (2) a bobbin or reel mounted on each disc; (3) two straining pulleys (one above and one below the discs) over which the hoop is placed; these are adjustable vertically for hoops of different lengths. When two discs are used, they are caused to rotate in opposite directions so that the hoop "may be covered with two layers of cord or string in opposite "directions." Sometimes only one layer is required, sometimes two or more. The hoop travels slowly down through the eyes or tubes, the bobbins rotate with considerable speed, and the material thereon is wound round the hoop "in a helical direction." By weighting or otherwise putting sufficient tension on the covering material, the same "is made to bind tightly on the hoop "or endless band in helical coils and by that means impart an "elasticity" thereto.

The Specification contains a full description of the machine.

[Printed, 10*d*. Drawing.]

A.D. 1859, November 3.—N° 2502.

WILSON, WILLIAM.—(*Provisional protection only.*)—"Improvements in machinery for the manufacture of felted fabrics suitable "for the bodies of hats, caps, and bonnets." Conical blocks are placed on spindles "somewhat inclined to each other." The spindles are carried by an upright spindle which is caused to rotate opposite a carding engine, so that the sliver may be received on to the blocks. The blocks "are arranged to have a rotation "on their own axes first in one direction and then in the other."

[Printed, 4d. No Drawings.]

A.D. 1859, November 4.—N° 2519.

MEYER, Jean Gaspard.—(*Provisional protection only.*)—"The "employment of the Tacca Pinatifida as a substitute for straw "now used in various manufactures." The only information given is that this straw is "whiter, lighter, and more brilliant "than that usually manufactured," that it does not become yellow, and that its colour is not affected by the sun.

[Printed, 4*d*. No Drawings.]

A.D. 1859, November 19.—N° 2627.

LAIDLAW, George.—"Improvements in hats and other cover-"ings for the head." This invention relates to the inside of hats; "whilst a perfect fit of the lining is afforded to heads of all forms "and proportions, one hat will answer for two or more differently "sized heads."

The body and brim are made in the usual manner. A strip of narrow gimp "of an open pattern" is sewn or attached to the inner margin of the brim; it is by preference "from one-eighth "to one quarter of an inch wide." The leather or other head lining "is made smaller than the hat itself;" its lower edge is sewn to the free edge of the gimp, so that it "stands in from the "body of the hat a distance equal to the width of the gimp." To admit of the expansion of the leather a piece of thin sheet india-rubber or similar elastic substance "is inserted at the back" of the leather. If the leather is enameled or moderately stiffened, no other attachment is required; if the leather is soft, it is preferred to have behind it "a band of stiffened cloth" attached to either the leather or the hat body, and strips of cloth are better than one continued piece.

In a modification short pieces of vulcanized india-rubber tubing are arranged at equal distances between the leather and the hat body; or strips of thin vulcanized rubber may be used, fastened "in a curved or bulging figure so as to extend inwards" to the leather. This modification is well adapted for felt caps, helmets, and shakos.

To conceal the opening left between the leather and the hat body, "a perforated shield or cover piece" or "a strip of gimp or "other permeable elastic fabric" may be inserted.

Ventilation is provided by placing a wire gauze ventilator in the crown.

[Printed, 8d. Drawing.]

A.D. 1859, November 22.—N° 2639.

AMSDEN, BENJAMIN.—" Improvements in the manufacture of " straw and other descriptions of hats and bonnets." This invention is intended to protect from injury and wear the outer edges of straw hats and bonnets.

A lay or cord is enclosed within a narrow band of suitable fabric, by preference of japanned cambric. The folded edges of the band are " secured to the outermost plait with the corded edge out- " wards." Another plait is sewn " over the inner edge " of the folded band so as to enclose it " with the exception of the corded " edge " between two plaits. The corded edge projects outwards " so as to form a finished edging to the hat or bonnet."

[Printed, 6*d*. Drawing.]

A.D. 1859, November 22.—N° 2645.

HILL, CHARLES GREY.—" An improved goffering machine " together with the apparatus connected therewith." The first improvement consists in " arranging a number of wires or rollers " in two series, each series being so connected together as to form " two distinct chains." Each chain passes round two rollers gearing into each by means of spur wheels, so that the chains revolve simultaneously. The wires or rollers in each series are (usually) " gradually diminished in diameter," so that " they will " plait or goffer the article in plaits of gradually decreasing width " until the narrowest width of plait is made, when the plaits " gradually increase in width." Sometimes the wires or rollers are " of the same diameter or of various diameters so as to form " the plaits of the same or of various widths;" this is effected " by guiding the chains by a tappet plate or by furnishing the " rollers with eccentrics which move the chains towards or from " each other " as may be required.

The second improvement consists in using in connection with the machine " steaming boards which have their corresponding " faces convex instead of parallel."

The wires or rollers are arms having the outer ends circular and the inner ends pierced with two holes whereby they are riveted to each other and form a chain.

The bearings of the axles of the rollers, round which the chains revolve, are formed in " cast-iron slides fitted to slide on a V-cut " on the upper and lower projections at the ends of the standards."

The bearings for the upper axles "are secured when set at the " required distance from the lower axles by a screw." The eccentrics or tappet plates, "two to each lower axle," "are all " identical in size and are extended at one side at the circumfer- " ence, where they form a short slotted arc, a screw passing " through the slot, by which they are held fast to the side of the " standards." The arc is graduated, and a small pin "is screwed " in the standards near the clamp screw to shew the number of " divisions the arc has passed."

Hot air flues, "three in each casting," are connected to each other by flat wrought-iron flues, "thereby forming two flues " through which hot air passes up" from a perforated gas pipe " running across the centre of the machine and partly along each " side opposite to the entrance to each flue."

The steaming boards have at each end a thumb-piece and likewise a bearing piece which keeps the boards at such a distance apart "that they may not crush or nip the plaits during the sliding " of the boards."

A full description of the machine, especially of the various kinds of wires or rollers which may be used, is given in the Specification.

[Printed, 2*s*. 10*d*. Drawings.]

A.D. 1859, December 9.—N° 2797.

DUNNICLIFF, JOHN DEARMAN.—"An improvement in the " manufacture of bonnet fronts and ruches." The improvement consists in substituting "warp or loop-made fabrics" for bobbin net, tape, &c. in the banding of goffered fabrics.

The patentee has found that such fabrics "by reason of the " manner of their manufacture present a quality peculiarly suiting " them for the manufacture of bonnet fronts and ruches." The fabric is "stiffened and folded into the form of a band," and the goffered fabric is fixed into the band in the ordinary manner.

[Printed, 4*d*. No Drawings.]

A.D. 1859, December 15.—N° 2858.

GADD, WILLIAM.—"The manufacture of edgeings and quil- " lings made simultaneously on lace or warp lace machinery." This invention is intended "for the same object as the ordinarily " joined" edgings and quillings, namely, "for the manufacture " *of ruches* for bonnet and cap fronts."

The warp threads "and those which are called thick threads" are arranged on one machine "in a proper manner" for the manufacture of edgings in some parts of the machine, and quillings in other parts, "either alternately" or two edgings and one quilling, or two edgings and two quillings, "or in any other "varied manner."

The threads "are actuated in their movements in the top or "bottom bars by a jacquard, or by wheels, or pin plates or "chains, or other equivalents suitable thereunto, or by the "jacking of the threads."

Quillings are manufactured "in the several varieties of what "is called Mechlin net," and the patentee prefers to use cotton as the material; in the manufacture of edgings he prefers silk, spun silk, cotton, or a combination of the same.

[Printed, 4*d*. No Drawings.]

1860.

A.D. 1860, January 10.—N° 62.

MORRISON, WILLIAM HENRY, and KINSEY, HENRY.—(*Provisional protection only.*)—"Improvements in means or apparatus "employed in the manufacture of bonnet and cap fronts, rouches, "and other articles of millinery, parts of which improvements "are also applicable in the treatment of lace for other purposes."

First improvement:—The quilling is passed over rollers in contact with brushes which revolve in liquid. Guides allow the edges only (or the parts required) of the quilling to be moistened. "The edging is placed in position upon the moistened edges," and both quilling and edging are passed between heating cylinders. One cylinder is "of large diameter," in order that, "the materials "being passed partly round and kept in contact with it for a "time," perfect adhesion may be insured. The united fabrics are conducted by guide rollers to a creel.

Second:—This relates to means "for insuring the measurement "of the fabric employed." The fabric is passed "between sur-"faces of india-rubber kept distended by being supported be-"tween two pairs of rollers." One surface is connected to "a "registering apparatus."

Third:—"A glossy effect" is produced upon the fabric by moistening it and passing it under heated cylinders of polished brass or copper.

Fourth:—This relates "to steaming and drying the gofferings." Projections "forming cells or chambers" are applied to endless bands passing over pulleys; these receive the gofferings, and keep each plait "separate whilst first acted upon by steam," and then dry them by heat from a hot plate or by hot air.

Fifth:—This relates to folding the fabric and applying the band to it. The endless bands have the projections placed "at each " side thereof," leaving space "for a band to be conducted down " the middle;" a knife edge presses on and folds the fabric to the band; and "nipping rollers or other nipping surfaces" act upon the band "to insure adhesion."

Sixth:—The nippers when open "form an inclined groove," and when closed "are in the same plane."

Seventh:—The bands are dried on "by passing them whilst " held by endless straps or plates between or over heating sur- " faces." The straps or plates may be arranged "to give the " desired nip or pinching influence on the bands."

[Printed, 4*d*. No Drawings.]

A.D. 1860, January 16.—N° 110.

ALDRIDGE, Frederick Thomas.—(*Provisional protection only.*)—"An improved soft waterproof cloth hat." The body is made of "swans' down, together with a solution of india-rubber;" it is covered with "superfine cloth, steamed, without a seam," thereby "rendering the hat perfectly waterproof and soft." Lining and binding may be added, as in the ordinary manufacture of hats.

[Printed, 4*d*. No Drawings.]

A.D. 1860, January 25.—N° 187.

RAMSPACHER, Théodore, and SCHMIDT, Christophe Frédéric.—"Preparing wire gauze to render it applicable to " various purposes," among which are mentioned shakos, helmets, " and soles for boots and shoes."

The gauze may be of various forms, either ordinary gauze or gauze " without weft," or gauze having the meshes "in part filled with " metallic substances," or "having its weft made of a vegetable " or animal substance."

The meshes are filled with molten metal, either by immersion or by the aid of the galvanic battery, and the gauze thus treated is covered with leather or other fabric.

"For most applications," the meshes are closed with gummy substances, such as "india-rubber, gutta percha, marine glue, " linseed oil, fish glue, resins, tar," alone or mixed together; these substances are used hot or in a state of solution.

When the covering is put on, the whole is subjected to pressure.

[Printed, *4d.* No Drawings.]

A.D. 1860, February 1.—N° 262.

HARDING, Gustavus Palmer.—(*Provisional protection only.*)—" Improvements in hats and similar coverings for the head." These hats are made from "fabrics woven from fibres of the aloe, " jute, flax, India or China grass, or analogous plants, either in " combination or not with india-rubber, gutta percha, shellac, or " similar gums."

The fibres are used "in a coarse thready state," without being brought "into the state of yarn;" they are woven into sheets, either alone or in combination with finer substances, and the parts of the hats are " struck out of these sheets by blocking or " by means of presses." The india-rubber or other gum is "laid " between the sheets of this new fabric or incorporated with it " in any desired manner."

Hats may be made from this material "by means of circular " looms;" the material is so woven " as to serve equally for lining " as well as for the exterior."

The material may be woven "in the form of bells or cones, " whereby they may be made in one piece and shaped as in felt " hats."

These hats "will allow the air to pass freely through the " texture, whilst at the same time they resist water, and do not " lose their shape from the action of moisture."

[Printed, *4d.* No Drawings.]

A.D. 1860, February 1.—N° 264.

MATTHEWS, John William.—(*Provisional protection only.*)—" An improvement in the manufacture of hats." The body and brim of this hat are covered with " woven woollen cloth." The body is made "in the ordinary manner employed in making silk "hats." The cloth covering "is made complete, with all its "seams sewed ready to be put on the foundation," and it is secured to it by varnish or other suitable adhesive matter. The brim is covered with the cloth, and the joint formed by the meeting of the cover of the body and the cover of the brim is concealed by a band as in other hats."

[Printed, 4*d*. No Drawings.]

A.D. 1860, February 25.—N° 517.

DEAN, WILLIAM, and PEACH, CHARLES.—(*Provisional protection only.*)—"An improvement in the manufacture of wreaths "or trimmings for ladies' bonnets and other articles of dress." In the ordinary ribbon loom are placed threads "forming a "narrow warp," and "in these threads are placed two fine brass "wires running parallel therewith." The weft is of silk or other material, and the weaving is similar to ordinary ribbon weaving; but the article produced "has only a narrow strip of warp "threads in the centre, and on each side the weft forms a long "open loop," somewhat like "a double looped fringe." To determine the width of these loops from the centre two strong threads or wires are placed, "one on each side of the warp, at "a certain distance therefrom;" the weft thread "passing "round the same is thus kept at any required width."

The fabric is taken from the loom, and "by means of the "two fine wires the whole is twisted together so as to form a "circular looped wreath or trimming."

[Printed, 4*d*. No Drawings.]

A.D. 1860, February 27.—N 535.

COOLEY, ROBERT BARLOW.—"Improvements in the manu"facture of plain or ornamental woven or looped fabrics from "certain descriptions of yarn, and for the application of such "fabrics to the making of various articles of dress, and for other "uses, such as hats, caps, gloves, hosiery, lace shawls, mantle "and other cloths, curtains, table, umbrella, and other covers, "such fabrics being made with or without terry plush or cut pile "surfaces." The patentee does not claim the spinning of yarns, "but simply the application of yarns spun from mixtures of silk "with particular kinds of wool, hair, or down" to the manufacture of the foregoing articles. The fur or hair preferred is that of "the beaver, the vicugna or vicuña, the musquash," or other similar fur, hair, or down. Cheaper yarns contain certain proportions of wool, cotton, flax, jute, China grass, or other fine fibres. The proportions vary; for many purposes equal parts are used; if softness and warmth are required, the fur or hair preponderates, whilst a larger proportion of silk increases the brightness and lustre of the yarn.

[Printed, 4*d.* No Drawings.]

A.D. 1860, March 12.—N° 664.

NEWTON, William Edward.—(*A communication from S. B. Tobey.*)—"Improved machinery for making hat bodies." This machinery comprises a picker "for receiving, picking, and throwing" fibres of fur, and the doffer of a carding machine for delivering "a bat of carded woollen fibres," on to "rotating and vibrating cones."

The doffer "being well known" requires no description; the bat passes from it, and is wound upon a pair of cones, "constructed and operated by means well known to hat manufacturers."

The picking apparatus consists principally of a feed apron, a pair of feed rollers, and a "rapidly rotating picker" by which the fur "is loosened, thrown, and scattered within a surrounding case;" the apparatus is placed "in the upper part of the frame." The case or cap is in the form of "a hollow semi-cylinder;" one edge of it extends over the feed rollers, the other edge "extends down in a tangent to form the outside of a vertical spout" to within a short distance of the upper surface of the bat of woollen fibres as it passes from the doffer to the cones. The axis of the picker is midway between the inner edge of the spout and that edge of the case which extends over the feed rollers, "so that the circle of this cap is excentric to the picker." Within the case is a plate, "which extends in a curve from the inner periphery of the cap to within a very short distance of the picker (so as just to clear the teeth thereof), and is intended to break the current." The under part of the picker is enclosed by a bottom case, open at the back of the picker for the admission of air. In the front part of the case there is "an inclined deflector," by preference adjustable; its ends *slide in grooves*; its upper edge "is in close proximity with

" the inner edge of the spout," leaving an open space between it and the lower edge of the curved plate. The fur descends through this space down the spout "in a sort of shower, to fall on to the " bat of carded fibres." By this arrangement, the fur is deposited regularly on the bat, "so as thereby to form the hat bodies " of alternate layers of wool and fur."

[Printed, 8*d*. Drawing.]

A.D. 1860, March 23.—N° 751.

TAYLOR, John, TAYLOR, Mark, and TAYLOR, George.—(*Provisional protection only*.)—" Improvements in the manufacture " of hats, or of giving the final shape to the brims thereof." The " final shape, set, or finish " is given to the brim by means of a suitably shaped frame of wood, metal, or other material. The brim is softened "by a dry heat," and is applied to the frame " whilst it is in a soft state." This process is applicable to all coverings for the head.

[Printed, 4*d*. No Drawings.]

A.D. 1860, March 26.—N 775.

MARTIN, Charles, and PIDDING, William.—(*Provisional protection only*.)—" Improvements in the manufacture of paper, " applicable also to the manufacture of hats, bonnets, caps, and " various articles of ladies' and gentlemen's wearing apparel, " furniture, boxes, ornaments, bottles, casks, and various articles " of utility, vehicles, houses, sailing and steam vessels and boats, " and in the mixture of liquids, fibrous and other substances or " materials for such purposes, and in the machinery connected " therewith." The pulp is passed on to "a hollow air-tight " cylinder." "A vacuum chamber" is connected to the centre of the cylinder by "a hollow shaft or spindle." The vacuum is maintained by aid of an air-pump. The outer circumference of the cylinder is made of finely perforated metal or wire gauze covered with flannel or other suitable material. As the cylinder revolves, the pulp flows on to it, "and the liquid is abstracted by " the vacuum before named," leaving the pulp in a proper state to be conveyed on to drying cylinders.

The paper is cut into strips " by the cylinder having divisions *or by* a cylinder of "suitable width and form;" it is sized or has *combined* with it " caoutchouc in liquid state."

In the manufacture of hats, bonnets, and caps, a mould "of "perforated metal or gauze wire, prepared as before described "and connected with the vacuum chamber," is placed in the pulp; "the exhaust apparatus" is put into operation, and the article will at once be made.

The materials proposed for use are "animal and vegetable "fibre, sawdust, glue, resin, caoutchouc, lime, fatty and colouring "matters.

[Printed, 4*d*. No Drawings.]

A.D. 1860, April 18.—N° 977.

NEWTON, William Edward.—(*A communication from Mary Jane Osborn.*) — "Improvements in pressing bonnets, bonnet "frames, and similar articles." These articles, whether formed of one or several pieces, are pressed into shape "at one operation "by dies acting on the entire surface."

The upper die is secured to the lower end of a rack shaft by a bolt, screws, and plate, so that it can be adjusted as to position; it is made with a rim or flange round its lower edge. Heaters are placed all around and on top of the die, and a case is put over the heaters.

The block or lower die is of marble or "other material that will "not rust from the acids which may be in the articles;" it stands upright on an iron bed plate and is kept in place by screws. On the lower die are two steel pins, "which stick through the corners" of the article, and hold it in place; there are corresponding holes in the upper die.

If the article is made in several pieces, the pieces are put together on the lower die before the upper die is lowered on to it.

The rack shaft is worked by a crank and wheels.

[Printed, 6*d*. Drawing.]

A.D. 1860, May 4.—N° 1118.

RAILTON, Timothy.—"Improvements in the apparatus em-"ployed in the manufacture of cap or bonnet fronts." This invention relates to "the holders" of the apparatus, and is considered by the patentee to be an improvement on the invention for which he obtained Letters Patent bearing date October 28th, 1858, No. 2405.

The holders are "bent or formed to the required shape of the "cap or bonnet front;" "two outer sides" are hinged to them, and "a small rim or flange" is put at their edge to retain the net or fabric. Along the middle is "a longitudinal partition" which "serves as a partition between the holders and against the top of "which fall the outer sides," thereby forming "two compartments to contain the goffered or otherwise prepared blond, net, "or other fabric."

The process of manufacture is "the same as that described in "the specification" of the above-mentioned letters patent.

[Printed, 6*d*. Drawing.]

A.D. 1860, May 29.—N° 1327. (* *)

HUGHES, **Hesketh**.—"Improvements in machinery for "goffering, fluting, shaping, embossing, and connecting together "lace, ribbons, and other like materials, parts of which improvements are also applicable to the shaping and corrugating of "metals."

The object of the first part of the invention is to goffer, flute, or otherwise shape two or more pieces of lace, ribbon, or other light material, to connect the pieces together, and emboss or indent them, if required, in the same machine and under one operation. This is accomplished by employing an endless chain or chains, similar to that described in the Specification of a Patent granted to the present patentee on the 15th of May, 1844, No. 10,186, carrying a double set of pattern formers, the lower set goffering or fluting one side or section of each piece of lace or other material, while the upper set goffers or flutes the other side of the material. "The upper set of pattern formers is arranged "in such manner that it has a to-and-fro lateral motion imparted "to it, in order that the upper set may escape one material and "take up the other. The ends of the pattern formers carry "tail pieces which work in guides at the side of the machine, and "receive motion from the rotation of the endless chains. Rollers "or endless chains for pressing the two materials together at or "about their central part come into operation after they have been "goffered, and press a gummed cotton thread which is led from a "bobbin through the machine between the two materials, and as "the materials are pressed so the gummed thread holds them "together, and they issue from the machine in one piece as a "rouche or cap front according to the material operated on."

The object of the second part of the invention "is to produce "*gofferings* or flutings of varying sizes on lace or other like

" material," and for this purpose a portion of the central part of the leaves or pattern formers is cut away, according to the shape it is desired that the goffer or flute may assume, and in order that the material may work uniformly other pattern formers are placed between those before mentioned, only extending the length of the part cut away, in order that they may take up the same amount of material as that which passes over the uncut part of the pattern former. " By increasing or decreasing the length of the pattern " formers an immense number of patterns may be produced." The pattern formers are free to slide in guides or otherwise in this machine in a similar manner to that in which they slide in the machine just described. The embossing of the material is produced by leaves attached to the pattern formers, or working on a distinct chain, which leaves come into operation and emboss the material after it has been goffered, the said leaves working in guides in a similar manner to the tail pieces of the pattern formers. Rollers can be substituted for the leaves attached to the pattern formers, in order to produce the embossing of the material. The counterpart of the design engraved on the rollers must be sunk in one of the sets of the pattern formers to ensure accuracy; this is not necessary when velvet is operated upon.

The object of the third part af the invention is to connect or run together two pieces of lace, blond, or other material, and for this purpose a set of leaves are employed which have an up-and-down motion imparted to them by the guides at the side of the machine, similar to those before described, in combination with a fixed wave-shaped needle, made to correspond with the motion imparted to the leaves by the guides. This needle carries a thread, so that as the machine works, the materials follow the shape of the needle, and the thread is run through them.

The remaining parts of the invention relate to the shaping and corrugating of metals, and therefore do not require notice in the present series of Abridgments.

[Printed, 1*s*. 4*d*. Drawings.]

A.D. 1860, July 2.—N° 1596.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Auguste Durand.*)—(*Provisional protection only.*)—" Improve- " ments in the manufacture of hats." This hat is made " without " lining or head leather." A length of woollen, silk, or other suitable fabric is coated (on the side to which the plush is to be attached) with paste, starch, or gelatine, and then with a varnish of gum lac dissolved in essence or spirit. The fabric thus prepared is rolled "into a tubular shape," and the edges are glued together " to form the body of the hat." The crown is cut out of similarly prepared fabric and is united to the body by gluing or pasting a strip of cloth on to them; it may be strengthened by a band of cloth. The material which is to form the brim has pasted to its under side " a piece of cotton or other fabric prepared or stiffened in the " ordinary manner." The brim is connected to the body by gluing, pasting, or cementing a strip of cotton or other fabric over the inner end of the brim and the lower end of the body. The whole is blocked and covered with plush.

[Printed, *4d.* No Drawings.]

A.D. 1860, July 13.—Nº 1695.

HILL, CHARLES GREY.—" Improvements in machinery for the " manufacture of bonnet fronts, rouches, and other millinery " trimmings, or for other purposes." A hollow cast-iron platform or bed plate, heated by gas or steam, is secured to a standard at each end. " On the under side of the upper part" of the standard are three projections through which pins are passed. On the upper ends of the pins " drivers on hinged levers" move. The lower ends of the drivers "bear upon and work against " snugs cast on the top side" of an upper presser plate whose ends slide, rise, and fall in grooves in the standard. Each end of the standard forms a bearing for a shaft whereon three bosses are fixed. One of the bearings projects beyond the standard and ends in a slant; at this end of the shaft is a fly wheel having a boss on the inner side shaped like the end-bearing, "the boss and " bearing forming two cams of a double-wedge shape working one " within the other." If the fly wheel is turned partly round, the bosses on the shaft will be moved to the right and force down the lower ends of the drivers and thereby the upper presser. The upper presser regains its position by means of springs. "The " presses are somewhat narrower near the ends at the pressing " surfaces to make room for a short platform above the lower " presser and a driver to the upper presser." The platform is *supported* at each end " by springs coiled round two short rods" *which* "are free to move up and down in bearings" on the bed plate. On the top of the platform are studs "against "which the lower pair of moveable guides are placed," and cotter pins prevent the platform from "being raised above the "top of the lower presser by the springs." A second pair of guides (when required) are placed over the other pair; the arrangement is such that "the lower presser will have the goffered material in the bottom guides lowered on to it in the same "portion as the upper presser presses on to the material in the "upper guides." One side of each pair of guides has a slotted hole at each end; a stud slides therein, "by which means when "the goffered materials are pressed together that side of the guide "may be drawn partly away from the other" and held there "to "allow of easier access of the knife to the edge of the pressers." The back and front of each pair of guides are adjustable as to distance by set screws and springs; each pair is provided with two pointed pins for holding the ends of a damped band. Heat or steam passes from the lower to the upper presser by means of "swivel-jointed pipes." The knife is secured to a boss sliding on a rod; it is worked by a handle.

A goffering apparatus:—A cogged wheel is mounted "above "the bed plate and between it and the top presser;" the cogs "are of various depths and thicknesses;" each cog takes into a similarly formed groove on the top of the bed plate. This arrangement admits of modifications which are explained in the Specification.

The patentee uses guides constructed as above described "with "a groove and knife-making-up machine."

[Printed, 1*s.* 4*d.* Drawings.]

A.D. 1860, July 30.—N° 1850.

SPENCE, William.—(*A communication from Pierre Dujaric.*)—(*Provisional protection only.*)—"Improvements in the manu- "facture of hats." In these hats "the skins of which gloves "are ordinarily composed" are used "to form the covering or "outer surface." The skin is applied to the foundation or body; it is "stretched over the piece of material in the course of manu- "facture," and "is caused to assume the exact form thereof by "means of a hot iron;" it is afterwards "turned up, then fixed "and concealed under the projecting part forming the rim of the "hat."

"The remainder of the manufacture is the same as usual."

[Printed, 4d. No Drawings.]

A.D. 1860, August 8.—N° 1909.

MOSELEY, David.—(*Provisional protection only.*)—" Improve-" ments in the manufacture of hats, caps, bonnets, and other " coverings for the head, and in machinery connected therewith." The first improvement consists in coating the foundation or body " with flocks made from woollen, silk, alpaca, mohair, or other " fibrous materials," or " with cotton, or other light fabrics, or " paper, so coated with flocks."

The second, in effecting an equal distribution of the flocks over the surfaces by first coating the surfaces with an adhesive varnish, and " subsequently passing the same under an oscillating " sieve containing the flocks."

[Printed, 4*d*. No Drawings.]

A.D. 1860, August 15.—N° 1977. (* *)

GAGE, George.—(*Provisional protection only.*)—" Improve-" ments in the colouring and manufacture of straw plaits."

The inventor says,—" My improvement in colouring or dyeing " straw plaits relates to colouring them only with the colouring " matters known as mauve and magenta. I either colour the " straw and afterwards form the plait thereof, or form the plait " first and colour it afterwards. To dye or colour of a mauve " colour, I take one pound of mauve and dissolve it in about " half a gallon of naptha and about five gallons of water. For " plain (or mixed colours, which will be herein-after explained) " to produce light tints, I immerse the manufactured straw or " the plait in this solution while cold for, say, half an hour, " more or less, according to the tint. After submitting the straw " to the solution, I then place it in a paste composed of about " one pound of indigo, two pounds of sulphuric acid, and an " alkali to neutralize the acid, say, one pound of ammonia. The " straw is allowed to remain, say, half an hour, more or less; it " is then removed and dried, when it is fit for use. The paste " also has an effect on the tint. For deep tints of single colours " I boil the straw in the solution. In dyeing or colouring " magenta colour, I take one pound of magenta colouring matter, " and combine it with half a gallon of naptha and five gallons of " water. I immerse the manufactured straw or straw plaits in " this solution in a cold state for a longer or shorter time, " according to the tint required. When removed it is simply " dried, and is fit for use."

"My further improvements consist in manufacturing straw "plaits with the strands of the plaits, some arranged so as to "present the enamelled side of the straw on the exterior, com- "bined with others having the soft side presented on the ex- "terior, the whole being arranged according to pattern or orna- "mentation desired. I then immerse these in a dyeing solution "or colouring matter for a sufficient length of time; the soft "side of the straw will become dyed or coloured, while the "enamelled surface of the straw will remain uncoloured and "white, as originally, or it may have had the enamelled side pre- "viously dyed of another colour. This I effect with solutions "and colours above mentioned, while cold only."

[Printed, 4*d*. No Drawings.]

A.D. 1860, September 14.—N° 2231.

GEDGE, William Edward.—(*A communication from François Munier.*)—"Apparatus for goffering felt or cloth hats or other "analogous articles." The object of this invention is to effect the goffering "by one blow or impression."

The apparatus is composed of a screw or other suitable press, a hollow corrugated metal shape or form fixed on the bed plate and heated by steam or otherwise, and a similarly corrugated bell or cover secured to the lower end of the press screw.

The article to be goffered is placed upon the shape, and the bell is brought down on to it by the screw.

Several apparatuses "may be coupled together," and the corrugations on the shape and the bell "may be different."

[Printed, 8*d*. Drawings.]

A.D. 1860, September 15.—N° 2249.

BARNWELL, Stephen, and ROLLASON, Alexander.—"Improvements in combining and mixing certain solutions of "pyroxylene with animal, mineral, and vegetable substances, by "which its quality is altered in such manner as to produce "hard, resistent, adhesive, plastic, or resilient compounds, and "articles unalterable in their nature and varied in colour, which "said compounds in a state of solution may also be advan- "tageously employed as paints or varnish." For the manufacture of pyroxylene the patentees prefer to use "common rags of "any description, plain or coloured." The material is submitted for from 20 to 24 hours to the action of "the mixed acids, nitric "and sulphuric."

The acids are then drawn off, and "the bulk is then to be "thoroughly and evenly mixed and boiled, then analysed, and "the loss of strength ascertained;" the loss is to be made up by the introduction of fresh acids, "when they may be re-used."

A very useful description of the same article is obtained "by "submitting fibrous and other matters containing cellulose to "the action of mixed acids of such modified strength and "temperature that they will be only partly converted into "pyroxylene;" this forms a kind of half-stuff.

The pyroxylene and the half-stuff must be freed from acids and dried "before advancing to the further processes."

According to the use to be made of the compound, some of the following ingredients are mixed with the pyroxylene:—Oils, essential, animal, vegetable or mineral; gums, resins, balsams, tar, pitch, bitumen cements, wax, tallow, grease, caoutchouc and gutta percha; ivory and bone dust, powdered bark, farinaceous and amylaceous substances, starch and dextrine; pigments and bronzes; chloroform, bisulphide of carbon, ether, alcohol, anhydrous basic salts (that will in any way combine with it), iodide of potassium and cadmium, and oxides of metals for imparting colour.

A solution of pyroxylene may be used as "a coating for hat- "bodies, for boots, shoes, and leather in general."

Buttons may be made by stamping them from a sheet of the new material, or by shaping them in moulds whilst the material is in a plastic or semifluid state.

The material in a plastic state is very useful "for employment "in moulding or taking fine casts, such as those required for "purposes of dentistry and modelling for jewellers, goldsmiths" and others requiring sharp, smooth, and indestructible models or moulds.

"These are but a few of its applications."

[Printed, 6*d*. No Drawings.]

A.D. 1860, October 8.—N° 2438.

CALKIN, JOSEPH.—"Apparatus for protecting the upper por- "tion of the face from the inclemency of the weather, dust, or "*otherwise*." The patentee terms his apparatus "the occhi-

"ombra;" it may be worn either in connection with a cap or instead of a peak or secured round the head by a flexible band or otherwise.

The occhiombra consists of (1) a frame of wire; (2) connecting stays; (3) gauze, network, or other open fabric forming the covering or shade; (4) an "open gauze work diaphragm caused "to rest upon the nose or face immediately below the eyes and "capable of being fitted thereto through the medium" of (5) an inner curved wire; (6) a spring head frame for readily applying or removing the occhiombra; (7) a passage or opening at the top for the escape of heated air.

The construction admits of modifications; it may be such as to form a shade to one eye only; it may be folded up by making the frames with sliding, hinged, or pivot joints.

[Printed, 6*d*. Drawing.]

A.D. 1860, October 31.—N° 2661.

GHISLIN, THOMAS GOULSTON.—(*Provisional protection only.*) —"Preparing, applying, and adapting certain articles of vegetable "production called "Eiklonia Buccinalis, Proteaceæ, Juncus "Serratus, Juncus Trista, and Amaryllideæ, to further new purposes of manufacture." Of these vegetable productions the juncus trista is applicable for the manufacture of such articles as "wire, reeds, canes, straws, and other products are generally used "for." Amongst the articles enumerated are "bonnet shapes "and framework generally."

[Printed, 4*d*. No Drawings.]

A.D. 1860, November 2.—N° 2679.

DELAROTHIÈRE, JULES CHAUMONNOT.—(*Provisional protection only.*)—"Improvements in stocking frames." An apparatus is applied to the frame "for lessening the width of knitted "fabrics, and more especially for knitting stockings without "seams." If the frame is rectilinear, "the required widths are "obtained at once." If the frame is circular, the fabric "is cut "according to the form and size of the article required and then "mounted on a rectilinear frame to form the parts which are to "be narrowed, such as the ends of the feet of stockings, caps, "gloves, and other articles so as to avoid the use of bands of "stuff." A certain number of meshes are carried over on each side of the fabric, and these "are united with the meshes of the "edge as each row of meshes is formed."

A frame fixed to the loom supports by two pivots a bar, "upon which slide the needle carriers of different sizes, and to "which the needles are attached." The carriers are adjustable as to distance from each other. Brackets fixed to the bar support an axle fitted with a spiral or screw thread, "in which are screwed "or otherwise fastened small screws or pins;" these rotating "act against an inclined stud fixed to each of the large needle "carriers," and their heads "coming into contact with these studs "cause the needle carriers to approach or recede towards each other "as required." On the axle is a spur wheel "in connection with "the loom for regulating the rotation of the spiral." At one extremity of the bar is "a frame furnished with two screws for "regulating the pressure of the needles of the apparatus on the "needles of the loom."

[Printed, 4*d*. No Drawings.]

A.D. 1860, November 12.—N° 2771.

WEST, Hiram Edwin.—"A machine for pressing and shaping "straw hats or various other articles of like character." The base plate of the machine is "constructed with parallel ways" for guiding the carriage of an "expansive block." The carriage supports a circular head, through whose hub a shaft carrying a hand wheel is screwed. The inner extremity of the shaft "is so "connected with a pyramidal frustum" as to cause it to move with the shaft to and fro in the direction of its axis. "Against "each face" of the frustum "a block section carrier" is placed and is connected with the head and the frustum "by dovetail "tenons and grooves;" sections of the expansive block are screwed or otherwise secured to the carrier. "An elastic hood" encompasses the sections; it is made by preference of caoutchouc or other substance waterproof and capable of withstanding a temperature "considerably above that of 212° Faht." The hood fits closely to the external surface of the block, "and should cor-"respond very nearly in contour with that of the hollow concave "surface of a mould" which is supported on a stand in front of the block. The mould is of cast metal, and "is extended into "and surrounded by a heating vessel;" at the end nearest the block are two hooks or latches which take into the short arms of two levers suitably connected to the head and shaft.

The hat to be pressed and shaped is drawn closely on to the hood; the carriage is driven forward toward the mould until the hooks "have been elevated by and made to latch upon the shorter " arms of the levers," the wheel is then turned, and the screw will "force the pyramidal frustum forward and effect an expansion" of the block and hood.

[Printed, 6*d*. Drawing.]

A.D. 1860, November 13.—Nº 2775.

MENNONS, MARC ANTOINE FRANÇOIS. — (*A communication from Gustave Victor Roger.*)—" An improved manufacture of " coverings for the head." This invention relates (1) to "the " preparation of a plastic composition intended to imitate and " replace straw, chip, cane, whalebone, and other analogous " matters ;" (2) to the processes and appliances for bringing the composition to the form, &c. required.

1. Pulverized cotton dyed to the desired shape is added to " semifluid collodion formed by the solution of fulminating " cotton in sulphuric ether ;" a " thin pasty mass " is the result, and with it is incorporated from 1 to 3 per cent. (of the weight) of castor oil.

2. The mould employed is obtained " by the deposit of copper " on the outer surface of a chip, straw, or other hat " by the ordinary electrotype process; it is surrounded by a casing of wrought iron, " and the whole is consolidated by running into " the free spaces a quantity of melted zinc, brass, or other suitable metal."

The body of the hat (" of any convenient tissue ") is coated on both sides with the composition; when dry it is put into the mould " and carried to a powerful hydraulic press." The inside of the body " is then filled with discs of vulcanized caoutchouc " of corresponding diameter and in sufficient number to pass by " a short distance the upper edge of the mould, a sheet of caoutchouc large enough to cover the brim being laid over all."

The mould is heated to from 75° to 89° centigrade, and the whole is submitted to a pressure of from 150 to 300 atmospheres. The caoutchouc, " forcing the plastic matter into all the interstices of the mould, produces an exact copy of the model from " which the latter had been electrotyped."

The hat when carefully removed from the mould "is finished "off in the ordinary way."

[Printed, 4*d*. No Drawings.]

A.D. 1860, December 20.—N° 3124.

MOSSMAN, William.—"The manufacture of bonnets from "papered cloth." This material is made by pasting together (or otherwise causing to adhere) sheets of paper and cloth. The cloth may be "of cotton, linen, silk, wool, hair, or any fibre that "can be woven into a texture." The papered cloth may be "embossed or plain, and cut into strips to be plaited or sewn "together, or may be used in pieces to imitate all kinds of chip, "Leghorn, Tuscan, straw, crinoline, and braid."

[Printed, 4*d*. No Drawings.]

1861.

A.D. 1861, January 23.—N° 182.

CLARK, William.—(*A communication from Louis Bonard.*)— "Improvements in circular looms for weaving hats and other "articles." This invention comprises certain devices for carrying, "operating, and guiding the warp holders" for "attaching the "warp," for "laying the woof in circular form," and for "forming the crown of the hat."

A vertical shaft is secured in the bed of the machine. A frame rotating on the shaft is supported at its periphery on wheels; it carries an upper and a lower ring connected by links, "and "formed with corresponding vertical slots to carry and guide the "warp holders." One holder is placed in each slot; it has at its outer end a projecting lug to elevate it, and "at a cross bar in "its centre a hook," upon which an india-rubber ring is placed "to form an elastic attachment for the warp." Sliding pins are placed between the warp holders; "a circular or bevelled rack "attached to the under side" of the lower ring is in gear with two cog wheels mounted on the same journal; the smaller wheel "constitutes a frame for the attachment of a rim" whose *periphery* is formed with "alternate cavities and projections, the

" latter of which act to elevate such of the pins as come in con-" tact with them." The journal " is hinged to the bed " of the machine, so that " it can be turned down in a vertical plane," and different rims can be attached " without coming in contact with " the pins."

A waggon, " placed concentrically on the exterior " of the lower ring, is supported on wheels upon a flange which projects from the ring " so as to permit said ring to revolve independently " of the waggon, the latter being held stationary by means of " spring catches and latches." Secured to the inside of the waggon are " inclined sideways adapted to receive the lugs of " such of the keys as are elevated by the action of the rim and " pins."

The woof carriers are secured to the waggon; " they project " horizontally inward through the centre and through the space " between the rings." The woof carriers are constructed as follows:—A flanged bar is fixed to the waggon; it has on its inner end " a sleeve-piece to which is pivoted a head consisting " of a crescent-piece with a projecting arm;" a link formed by a right and left screw and nut is attached at its ends " to the pro-" jecting arm and stationary point." The head is set at any angle by means of a screw bolt secured " within the bar and " threaded in the sleeve." Bobbins carry the woof " which passes " through eyes to the laying mechanism."

The block upon which the crown of the hat is woven is supported and elevated in the warp frame by cog wheels, pulleys, and an endless chain, the arrangement of all which is described in the Specification. A cylindrical bell is placed concentrically over the block " to form the vertical sides " of the body; it is held down by means of a hand screw.

" The operation of weaving a hat " is explained.

[Printed, 8*d*. Drawing.]

A.D. 1861, January 23.—N° 185.

WILSON, William.—" Improvements in the manufacture of " hats." This invention comprises two distinct arrangements of machinery; one for forming four hat bodies " by one machine " at one carding engine " and allowing " the brim to be formed " thicker," and one " for hardening the bodies without removing " them from the blocks on which they are formed."

1. Two carriages, each carrying two pairs of cones, are placed on the same frame. The cones "are driven by suitable gearing " on a shaft running between and connected with said carriages." Blocks for the hat bodies are placed on the cones and receive the sliver as it comes from the carder. In the middle of the shaft is a right and left hand screw, "the right-hand thread passing " through or crossing the left and uniting with it at each end so " as to form a continuous groove," so that when a tongue which runs therein comes to the end of one thread, "it turns on its " pivot and runs back to the other, thus making a continuous " reciprocating motion." The tongue is attached to and guided by a slide parallel to the shaft, and connected with the slide and parallel to the shaft is a rod connected with the two carriages which receive motion "by means of a lever connected with both " at a right angle." The lever "is attached at one end to a pivot " which acts as a fulcrum; and at the other to the slide, and between them to the rod by a joint;" as the fulcrum is moved from or to the connecting rod, "the carriages make a longer or " shorter traverse."

To form the bodies thicker at the brim "the fulcrum is attached " to a slide which is in the direction of the lever, so that by " moving it along the slide the length of the lever is varied." The lever "being bent at the part attached to the connecting " rod," when the fulcrum is brought under the joint, the rod and the carriages are stationary, and the sliver winds on the blocks "for as many revolutions as is needful;" this is regulated by a ratchet wheel "revolving one notch for every traverse of the " tongue slide" and "also ringing a bell when the bodies are " fully formed."

2. A turn table divided into three equal parts carries on each a circular plate whereon is a stand for the reception of a block with a hat body on it. The table is moved by "a small friction pulley " working against a larger pulley (or it may be against the turntable itself);" the larger pulley (or the table) has three indentations and three projections on its circumference, and when one of the former "comes to the smaller pulley," the table is stopped " until the pulley is again put in contact by a lever." The table makes "exactly one-third of a revolution at once." After the body is placed on the first of the three parts, "it moves to the " *second* where it is steamed and proceeds afterwards to the third

" to be hardened, returning next to the first to be removed." Over the table is a framework connected with which is a slide hat will move up and down and cover the parts used for steaming and hardening; "attached to that for steaming is a hollow inverted vessel to cover the block and fit close to the table; this " is filled with steam to moisten and harden the hat." Attached to the part for hardening is a hollow cone lined with vulcanized india-rubber, " larger than the block with body on, but so made " as to fit it evenly down the side." The cone is mounted on a universal joint so that every side can be pressed "successively and " continuously" by means of suitable gearing. Whilst the outer cone is so acting, " the inner receives a reciprocating motion by " means of a short upright shaft under the turn table." The shaft receives its motion from a small crank.

The blocks and the cones on which the bodies are hardened are to be covered with vulcanized india-rubber.

Full details of each machine are given in the Specification.

[Printed, 1*s.* 4*d.* Drawings.]

A.D. 1861, February 9.—N° 325.

FREYSTADT, HERMANN.—(*Provisional protection only*).—" Improvements in the manufacture of bodies for caps, hats, bonnets, " baskets, bags, and reticules, and other similar articles of light " work." These bodies, &c. are made of manilla joined to manilla, or manilla to willow, or willow to silk, cloth, linen, or leather, "by means of an interposed sheet of gutta percha." In uniting manilla to manilla, the grain of the one sheet must be " transverse or crosswise to that of the other."

A sheet of manilla is passed tightly over a warmed roller; a thin sheet of gutta percha is passed tightly over a cold roller; the two are pressed together "surfacewise" between rollers; the united sheet (or a portion of it) is put into a mould; a second sheet of manilla is put in next the gutta percha side; the mould is heated; the whole is firmly pressed together, and is at once united and formed into shape.

Or a sheet of gutta percha may be placed between two sheets of manilla, and the whole may be pressed surfacewise in a heated press before the mould is used.

[Printed, 4*d.* No Drawings.]

A.D. 1861, February 26.—N° 498.

SIDEMAN, Louis, and PHILLIPS, Samuel.—(*Provisional protection only.*)—" Improvements in hats or coverings for the head." A felt, velvet, silk, alpaca, tweed, cloth, or calico brim is combined with a body of a horsehair fabric, or a fabric containing horsehair either in the warp or weft, and woven open to allow the escape of perspiration and the access of air. The body of such a hat is of a shape approaching that of a dome or hemisphere.

[Printed, 4*d*. No Drawings.]

A.D. 1861, March 15.—N° 648.

GRANGER, Arthur.—" Improvements in the manufacture of " hats, bonnets, waistcoats, and trimmings for wearing apparel."

1. Hats and bonnets:—The bodies are made from sheets of paper or paper cloth, or from paper pulp. In the former case the sheets are saturated with paste and laid over each other, upon or (by preference) within " divided moulds of plaster of Paris or other " material." The body when removed from the mould is dried, and the rims are strengthened with canvas or woven fabric. When pulp is used, it is pressed into moulds or formed into shape upon forms of wire gauze or other porous surfaces, the air being exhausted from the interior of the forms as " in the manufacture of " seamless paper bags." The body when dry is coated on the exterior face with suitable varnish, and before the last coat is dry flock dust or powder is sifted over it.

2. Trimmings are made from paper, paper cloth, paper pulp, or thin cardboard. The substance is shaped, moulded, or cut out, and coated with fibrous flock; afterwards it may be embossed or impressed to imitate velvet and other trimmings.

[Printed, 4*d*. No Drawings.]

A.D. 1861, March 30.—N° 780.

COPPO, Guiseppe Mateo.—" Improvements in machinery for " fulling felt hats, and other felted goods." The " leading fea-" tures of this machine " are (1) " hollow beaters; " (2) a trough " composed of wood and different metals superposed; " (3) the arrangement for the admission of steam or other heating agent to the trough.

The levers which carry the hollow mallets are pinjointed at one end to an upright; the other ends are raised by rollers on the driving wheel; each is provided with a ring by which it can be suspended out of the reach of the rollers when required.

The trough is composed of an external cast-iron box open above; next to the iron is a lining of sheet lead; above the lead is a lining of wood, and above the wood a lining of sheet copper. On the top of the trough is "a portable cover provided with holes for " the passage of the mallet levers."

The steam is introduced "through the cast-iron and between the lead and the wood, or between the wood and the copper," and " arrangements are made for providing sufficient space for its " passage." In the wood are grooves "all leading towards one " common pipe provided with a cock for purging the machine of " condensed water." The steam after due circulation is allowed to escape or " to flow on and amongst the felts at that part where " the cheeks of the trough unite with the bottom." Heat may be imparted by means of hot air or hot water.

Before submitting felts to the working of the machine they are dipped in boiling water "containing in small quantity either " vitriol, alum, potash, or alkali," and the strength must be kept up during the fulling.

[Printed, 6*d*. Drawing.]

A.D. 1861, April 6.—N° 853.

GHISLIN, THOMAS GOULSTON.—(*Letters Patent void for want of Final Specification.*)—" Preparing, applying, and adapting " certain vegetable productions called eiklonia buccinalis, pro- " teaceae, juncus serratus, juncus trista, and amaryllideae to fur- " ther new purposes of manufacture, and certain modes to effect " the same." The provisional specification contains only a list of the articles which may be made, veneered, coated, mounted, inlaid, or ornamented with the above named plants. No mode of preparation is given.

Cap peaks and artificial flowers may be made of "eiklonia buccinalis;" bonnet shapes and framework generally of "juncus " trista" either alone or mixed with other material; and artificial flowers of "proteaceae."

[Printed, 4*d*. No Drawings.]

A.D. 1861, April 24.—N° 1025.

WILSON, WILLIAM.—" Improvements in the manufacture of " hats." The object of this invention is to felt hat bodies made *entirely of fur or of wool* and fur mixed.

The apparatus employed is of the following construction:—Within a frame is placed a wooden cistern containing water heated by steam or otherwise. An endless apron, "composed of pieces of " wood with their upper surfaces rounded," passes through the cistern and over rollers at each end of it; it is directed by guide pulleys "and passes under water over slides in the cistern placed " to keep it level."

On each side of the frame is an iron slide in which an iron frame is placed, and to the frame another iron frame is attached by a screw and four guide pins. The latter frame carries "a " wooden fluted board (the fluted surface downwards)" secured to it at each side by an upright "rod which acts as a fulcrum to " a lever with weights intended to balance the board." Between the frame and the board are springs with guide pins "to keep the " board in position and yet yield a little upwards."

The main frame carries a crank shaft with two rods connected with the first-mentioned iron frame, so that "a backward and " forward or jigger movement" is communicated to the frame in the slide and of course to the fluted board. The machine is set in motion by "suitable and ordinary gearing," and the pressure of the board is regulated by the screw. A piece of wood is attached to the board "slanting upwards so as to direct the rolls " of hats under it and prevent their coming in contact with its " edge."

The hat bodies are dipped in hot water, rolled in a cloth, put on the apron, and submitted to the action of the machine until they are sufficiently felted.

[Printed, 6*d*. Drawing.]

A.D. 1861, May 8.—Nº 1157.

PICKETT, JOSEPH.—(*Provisional protection only.*)—"Improvements in covering or partially covering the sticks and handles " of whips and parasols, as also various other articles, with flock " and producing ornamental effects thereon." The inventor applies his invention to bonnets and caps. He prefers a shape of network or other like material and of the same colour as the flock intended to be used. He sizes the shape, dips it into a vessel containing a strong adhesive varnish or otherwise coats it with the varnish, and when the varnish is sufficiently set, dusts flock over it.

[Printed, 4*d*. No Drawings.]

A.D. 1861, June 28.—N° 1651.

FORD, Alfred.—(*Provisional protection only.*)—" Improve- " ments in the manufacture of waterproof felt." India-rubber or gutta percha is mixed with naptha or turpentine until it is reduced "to a very soft plastic state." Hair or wool, hemp or cotton fibre is added " in such proportions as shall result in the " production of a light pulpy dough." The dough is passed between wetted rollers " for the purpose of getting it into sheet " and giving to it a felt-like surface."

To make the dough " unusually light " cork or some vegetable fibre is added to it.

This felt-like material is applicable to the manufacture of hats and caps.

[Printed, 4*d*. No Drawings.]

A.D. 1861, July 2.—N° 1675.

BARBER, William.—(*Provisional protection only.*)—" Improve- " ments in the manufacture of hats." This invention relates to the brims of hats which have " greater exactness " given to their shape by placing them in moulds and forcing them into the same.

" Now, according to my invention," says the inventor, " I " curl, shape, or tip off hats of whatever materials made, by " means of a mould of the form of the intended brim, and I " force the brim of the hat into contact with this mould by " means of an elastic bag, into which bag I force water, air, " or other fluid."

[Printed, 4*d*. No Drawings.]

A.D. 1861, Juiy 17.—N° 1801.

HARE, Sir John, and **RUSS**, Barnabas.—(*Provisional protection only.*)—" Improvements in heating cylinder irons or " heaters to be used for pressing the seams of garments, finishing " of hats, or other purposes for which heated irons are ordinarily " used, and in apparatus connected therewith." The iron (which is hollow) passes in at one end of a metal chamber through a hinged door or flap. The end of a gas pipe passes into the chamber through the same opening. When the iron is in its place, the door is shut, and the gas is turned on " by a tap close " to the chamber " until the iron is sufficiently hot. When the iron is drawn out, " a lever is caused to fall by the door coming " in contact with it, which turns the gas almost out, leaving but " a very small flame." The lighted gas passes through a sheet of wire gauze " so as to prevent any smoke or soot getting to the " iron, all smoke being consumed in a chimney at the further end " of the chamber."

Several chambers may be placed side by side, and the pipes may be so arranged "that the gas may be turned from one to " another as desired."

[Printed, 4*d*. No Drawings.]

A.D. 1861, August 21.—Nº 2089.

MURAT, JOSEPH MARIE.—" Improvements in machinery or " apparatus for shearing military hat tufts and other similar " articles." On one end of the top of framework are two upright bearings which carry a horizontal spindle. On the inner end of the spindle is a tube " of steel split at a part of its length so that " it may be springy and retain the tuft securely." The spindle is attached to a frame turning on pivots, so that by moving the frame the spindle " may be lifted away from its bearings or " depressed therein when required." Rotary motion is given to the spindle by gearing connected to " the main driving pulley or " fly wheel."

The cutter carrier is mounted on a spindle which is supported in bearings standing on a carriage at the opposite end of the framework. Rotary motion is communicated to the carrier by pulleys and straps in gear with the fly wheel; longitudinal motion by means of a screw turned by a handle; and for " spherical or " ball-shaped tufts " the carriage " is moved in a horizontal circular " path round the tuft " by turning another handle. The carrier consists of " a six-sided body, on the sides or facets of which are " screwed cutters," one cutter on each side; it is brought nearer to or farther from the tuft by a screw " which works in a nut in " the thickness of the carriage."

A " counter lam " is attached to the carriage so as to be opposite the cutter carrier, or in such a position " that the filaments of " the tuft to be cut shall bear against it when the cutters come " round to cut them." The edge of the lam is horizontal; the edges of the cutters are oblique, " so that the cut is gradual instead " of being sudden."

The machine is set in motion by a treadle in communication with the fly wheel. The handles are worked by hand.

[Printed, 8*d*. Drawing.]

A.D. 1861, October 2.—N° 2462.

HILL, Charles Grey.—" Improvements in machinery or in " apparatus connected therewith in the manufacture of bonnet " and cap fronts, rouches, and millinery, or other trimmings." The improvements consist, says the patentee, " in any of the " various or numerous forms which may be produced by my " machinery, secured under my patents, dated respectively the " 22nd day of November 1859, and the 13th day of July 1860, " and respectively numbered 2645 and 1695."

1. Two moveable guides, " similar in character " to those described in the first-mentioned letters patent, have " a reversing " screw at each end." Between the screws are two strips of metal " having suitable portions cut away so as to correspond " with the corrugations or plaits of the goffered material." Or in lieu of such strips the patentee places " two or more rows of " pins," and " round those portions of the strips which are not " cut away, but which stand up vertically to the guides and form " pillars, or around the pins " he passes the ribbon carrying it " from side to side of the guides and around a pillar on each " strip alternately." He places the goffered quilling on the top of the ribbon and inserts " a corrugation or plait between the " lengths of ribbon as required, repeating the operation until " the guides are filled from end to end." He then stretches a damped silk or cotton band on the top and puts the whole under " the making-up press " described in the last-mentioned letters patent. The size, &c. of the pieces cut out of the strips and the size and position of the pins depend upon the quilling used and on the manufacture of one or " two fronts or rouches at once."

2. Two or more strips or rows of pins are used, " but the pillars " or pins stand up so high above the guides that the tops of " them will lie a little above the quilling."

3. The pillars or pins are " L or angular shaped," perforated to " slide upon two or more horizontal rods " on each side of the guides; when the ribbon is passed round them they are pushed together; " the distance at which they then stand towards each " other is regulated by washers or short tubes."

4. Two or more horizontal rods are used; they are of the same length as the guides, and the ribbon is passed round them. The ends of the rods lie in sockets on the guides "until the front or "rouche is made up, when the rods are easily released or with-"drawn from the loops." Clips hold the ends of the damped silk, &c., and the ends of the ribbon are placed on points.

5. Two or more rows of pillars or pins are set on each side of the guides.

6. Two or more rows of pillars or pins are "placed temporarily "or permanently on or in a board," and the ribbon and the quilling are put thereon. The materials are stitched together before they are placed in "the making-up machine" mentioned above or in "the knife and groove making-up machine."

[Printed, 1*s.* 4*d.* Drawings.]

A.D. 1861, October 12.—N° 2548.

CARRINGTON, SAMUEL RATCLIFFE.—"Improvements in hats "and caps." The improvements consist in corrugating the felt or other material at the lower part of the crown of the hat or cap through the band, the leather or pad being tight so as to fit the head of the wearer. At each corrugation there is an aperture for the admission of air into the interior. The corrugations of the material are carried from the band to the apex of the hat or cap, or to any intermediate distance, and either by regular or irregular corrugations. The corrugations may be made either by softening the body by heat or steam and then forming the hat to a suitable block; or by submitting it to hydraulic pressure inside a mould and within an india-rubber or other elastic bag.

[Printed, 6*d.* Drawing.]

A.D. 1861, October 26.—N° 2693.

HUTTON, GEORGE.—"Improvements in hats, caps, and other "such coverings for the head." These hats and caps are "elastic "so as to fit heads of different sizes." The invention is described with reference to a cap.

The stiffening is removed from part of the side of the band. This part is made "full so as to allow it to expand and contract;" it is stitched so as to form tubes, and springs of coiled wire are *placed within* the tubes.

[*Printed*, 6*d.* Drawing.]

A.D. 1861, November 18.—N° 2890.

CLEMENTS, James Moore.—(*Provisional protection only.*)—"Improvements in the making or manufacturing of certain parts "of garments for either sex, likewise in the manner of preparing "the same for sale, as also an improved button to be attached to "garments without sewing."

The first improvement relates to linings "applicable for ladies' "petticoats, bonnets, dress trimmings" and "gentlemen's coats." The lining is made to resemble quilting. Silk or other material is put over wadding with an adhesive surface, and the whole is passed between heated rollers "so divided that the concave parts "of the one shall exactly correspond with the convex parts of the "other," when the combined fabric will have the appearance of "very delicate and beautiful quilting." When "a third and "inner lining" is required, the fabrics are further united "by a "hidden stitch applied generally to the angles of the divisions." One of the rollers for effecting this object is divided "square, "spirally, or longitudinally by the application of strips of steel."

The second improvement relates to "vest back and stay shoulder "straps." Two rollers are employed, one smooth, the other "so "divided with steel blades" that a piece of fabric passing between them is cut into the shape required for such straps. The straps thus cut out are passed through a machine "to crease and stretch "the fabric into the shape desired;" they are so creased "that "one row of stitching in the centre shall pass through the three "thicknesses of the material." The thicknesses may be sized, folded together, and united by passing between hot rollers. Some straps are woven.

The third improvement consists in making "the tops and bands "of trousers" distinct from the leg portion. These parts are made with pockets, buttons, button-holes, &c. "ready to be "attached to the legs."

The improved button is made "with a flexible tuft at the back" and with "a pronged shank of two or more points" which are passed through the cloth and turned down. The prongs "may "protrude through corresponding holes in the back shell."

[Printed, 4*d*. No Drawings.]

A.D. 1861, November 21.—N° 2923.

JEFFS, James Harrow.—"Improvements in the manufacture "of collars, shirt fronts, cuffs, hats, bonnets, vests, and other

" articles of wearing apparel." These articles are made of "calico " or other suitable thin fabric, either white, or of any desired " color or tint."

Two sheets of the fabric are fastened together with starch, gum, and "patent size," and are then passed between cold rollers either engraved or plain.

Sometimes a sheet of thin paper or a thin layer of paper pulp is placed between the sheets. Sometimes only one sheet of fabric, either with or without paper or paper pulp is used.

The compound material is cut or stamped out to the desired shape.

[Printed, 4*d*. No Drawings.]

A.D. 1861, December 20.—Nº 3198.

BROOMAN, Richard Archibald.—(*A communication from Louis Bayard.*)—(*Provisional protection only.*)—" A new or im- " proved method of preparing silk fabrics to be employed in the " manufacture of hats, caps, and bonnets." Various dressings are applied to the back of the fabrics to render them waterproof and impart to them "the necessary stiffness for the bodies of hats, " caps, and bonnets."

The dressings preferred are three; first a coating of gelatine; second, one of caoutchouc; third, "the dressing usually applied " in the trade."

[Printed, 4*d*. No Drawings.]

1862.

A.D. 1862, January 16.—Nº 122.

WHEATCROFT, Henry.—(*Provisional protection not allowed.*) " —Improvements in the manufacture of bonnet and cap fronts " and similar fabrics." The improvements relate to the "banding " machinery" and more particularly to "machinery for banding " singles."

A plate mounted on a frame has its face "corrugated or trian- " gular" so as to present "two ridges;" its under side is heated *with gas.* "On the upper surface of the triangular faces" and *arallel to them* are "two small rectangular slips hinged so that

" when lying on the angular faces of the plate they form a " V opening, but when they are raised horizontally the opening " is closed." On the frame is a cradle, within which is suspended a box "for holding the front when about to be inserted in the " band;" when it is brought down on the plate, "it will insert " the projecting portion of the material centrically within the " opening or groove formed by the slip, within which is inserted " the wetted band to hold the rouching." The opening is then closed "by acting upon the slips so as to elevate their lower " ends;" the front "is enclosed by the net band;" is nipped by the pressure of the slips; and is caused to adhere by means of the heat.

The machinery may be arranged so that "while the one cap " front is being finished in the heated groove, the operation of " inserting another in the other groove is going on."

[Printed, 4*d*. No Drawings.]

A.D. 1862, January 20.—N° 141.

BARBAT, Léonard.—" A new and improved fabric applicable " to the manufacture of hats, bonnets, and other like articles." The patentee makes head coverings " either with a fabric having " its warp and weft wholly of animal hair, or with its weft of " hair and its warp of various materials, or of animal and vegetable hair, and lined with a fabric of animal and vegetable hair " alternately, or with one of these hair fabrics lined with a fabric " of silk or other suitable material."

Vegetable hair is obtained "from the leaves of the lupis, the " abaca, aloes, and other plants furnishing an analogous " material."

Sometimes he makes head coverings of horsehair covered with a fabric of any kind and lined with silk or other substance; the three substances are united with paste or are stitched together.

Head coverings may be made of various forms " by giving to " the fabrics to form the bottom the required shape and applying " thereto a brim of the required breadth covered at the upper " part with the same kind of material as the exterior of the hat, " and at the under part with a similar or different material."

[Printed, 4*d*. No Drawings.]

A.D. 1862, February 6.—N° 321. (* *)

DUNNICLIFF, John Dearman. — (Provisional protection *only.*)—" *Improvements* in the manufacture of lace or net bonnet

" fronts and other similar articles, and in apparatus used in this " manufacture." The inventor says :—

"According to my invention, in making bonnet fronts and similar " articles, the lace or net is first gofered by machinery, as is usual, " and before setting the gofered fabric into the band," "and " while it is resting on a suitable table or surface, I cause an in- " strument to descend on the top of the gofers. This instrument, " by pressing on the gofers and by moving in the direction of the " length of the fabric, throws them into an inclined position " more or less as may be required, and whilst the gofers are held " in the inclined position the fabric is pressed or set into the " band; this may either be done whilst the pressing instrument " is holding the gofers, or if the stiffening material of the fabric " be in a somewhat soft state when the gofers are thrown into " the inclined position, they may be held by the pressing instru- " ment till the stiffening material sets sufficiently, and afterwards " the gofered material may be set into the band as heretofore."

" Or, in place of proceeding in the manner above described in " gofering the fabric, I so arrange the apparatus as to cause the " instruments, which press on the fabric alternately on either side " so as to throw it into gofers, to move when in contact with the " fabric in a direction inclined to its length, in place of perpen- " dicularly thereto as heretofore; this arrangement will cause the " apparatus to produce inclined gofering in place of perpendicular, " such as has hitherto been produced by machinery. Fabric thus " gofered may be set into a band in the usual way."

[Printed, 4*d*. No Drawings.]

A.D. 1862, February 25.—N° 500.

WOODROW, JEREMIAH.—"A certain improvement in the " manufacture of hats or coverings for the head." The improvement relates to hat brims, and " particularly to such brims as " have the under side or surface covered with silk or satin or " other smooth substitute for plush;" it consists in extending such covering " to the upper surface also."

The silk or satin is stretched over the upper surface of the brim and passes over the edge to the under side in one piece, " whereby " the binding of the edge of the brim " may be dispensed with.

In brims " having much curl, such as the Anglesea curl," it is preferred " to put the satin on singly and connect the upper and " lower covering with binding."

When the silk or satin is cut in one piece, the seam joining the ends is back-stitched "at the back part of the brim and is scarcely "perceptible."

[Printed, 4*d*. No Drawings.]

A.D. 1862, February 26.—N° 521. (* *)

DOTHÉE, Jacques.—(*Provisional protection only.*)—"Improvements in the colouring or dyeing of horsehair tresses, hats, or "ornaments." These improvements relate to using "vegetable "or mineral colours, mixed up or diluted with spirits of wine, collodium, or other suitable rapidly volatilizing menstruum or a "mixture of two or more of such menstrua." "For colouring "or dyeing, for instance a horsehair hat, the same is put in the "usual manner on the block, and then rubbed all over with a "brush dipped into a solution or mixture of the pigment "with spirits of wine, or other suitable rapidly vaporizing "menstruum."

[Printed, 4*d*. No Drawings.]

A.D. 1862, February 28.—N° 551.

BROOMAN, Richard Archibald.—(*A communication from Louis Pierre Quenot and Henri Joseph Lebargy.*)—(*Provisional protection only.*)—"Improvements in the manufacture of hats and "bonnets." First, an improved manufacture of hats with a felt body and a covering of silk plush :—Smooth the inside surface of a piece of felt and ornament it "by printing or not according to "taste." Put the felt on a block with the non-prepared face outside. Coat the surface with hat varnish with the addition of caoutchouc or gutta percha. Strengthen the felt "by placing on "the top a piece of cloth, paper, or other material, and round the "edge where it is jointed." Apply a strip of cloth or linen to the body. Turn up the felt on the lower edge to form the brim, and stiffen the edge with a folded strip of linen. Put "an impermeable band" round the external surface. Lay on the silk plush and finish the hat in the ordinary manner.

Second, a method of making hats with a felt body and a felt face :—Take felt to form the interior of the hat; ornament it or not as desired. Block it and treat it as before described. Cover the body with felt or felted fabric. Prolong the felt covering downwards to form the brim, or prolong the body for such purpose; in either case stiffen the brim.

"For women and children's hats the external felt surface may "in shape and ornament correspond with that of the internal "surface."

Hats made in either way require no internal lining.

[Printed, 4*d*. No Drawings.]

A.D. 1862, March 1.—N° 556.

MÜLLER, HENRY CHARLES.—(*Provisional protection only.*)— "Improvements in the manufacture of imitation bear skin caps." Racoon skins, dyed "jet black to the root," are shaped into suitable form "with the skin so arranged that the hair in its "natural position inclines or stands upwards." The skins are then treated "with a strong solution of linseed water" and are well combed and brushed, and the hair is trained "in the "reverse direction to its natural inclination, causing it to fall "down and stand straight out from the cap."

[Printed, 4*d*. No Drawings.]

A.D. 1862, March 8.—N° 630.

CLARK, WILLIAM.—(*A communication from Jonas Haas.*)—(*Provisional protection only.*)—"Improvements in brims and "peaks of hats, caps, and other coverings for the head." The brim or peak, or the lining thereof, is adapted "to receive useful "articles, such as a miniature looking-glass, comb, pencil, slip "of vellum for keeping notes, or any small portable article "usually carried in the pocket." The looking-glass may be either "embedded in the thickness" of the brim, &c. and protected by a hinged cover, or "embodied in the thickness," or "detachable" and "fitted therein as in a case."

[Printed, 4*d*. No Drawings.]

A.D. 1862, March 10.—N° 644.

MAC LEOD, ALEXANDER CHARLES.—"Improvements in ven-"tilating hats and coverings for the head." They are shewn applied to "round-top" hats and to soldiers' helmets, and are stated to be applicable to any covering for the head.

At about the level of the top of the head of the wearer, round openings or elongated air-ways, provided or not with tubes, are made in the body of the hat. Surrounding the bottom of the body of the hat is a band or fillet, between which and the hat are placed pieces of cork or felt; or, for the same purpose of making intervals between the hat and the fillet, "the body of the hat may " be moulded into projections."

Where the fillet lies on the brim it is serrated, so that air from the outside may pass up between the intermediate space into the body. " Or, instead of any apertures in the fillet, there " may be apertures in the brim, or in both fillet and brim."

[Printed, 8*d*. Drawing.]

A.D. 1862, March 17.—N° 737.

BARBER, William.—" Improvements in the manufacture of " hats." After the patentee had on July 2nd, 1861 obtained provisional protection for his invention, he found "practical " difficulties in removing the hat from the mould after the brim " is curled"; these difficulties he has now overcome by making the mould in sections.

The apparatus employed is of the following construction:—A vessel is made in two parts hinged together; the upper is provided with a handle by which it can be lifted or turned about its hinge and with "a counterpoise to facilitate this operation." The parts can be locked together by means of a cross bar and lugs. "A " form to receive the hat and shape its brim" is placed in the vessel; it rests on a filling piece, discs of felt being interposed to bring it to the height required. When the hat is put into the form its interior is filled with a block. A flexible pipe enters the vessel; at its extremity is an elastic bag supplied with fluid " under pressure, say, of about 300 lbs. per square inch."

The hat is put in " whilst the brim is flat and the proofing " therein is in a soft state." The vessel is then closed and locked; fluid is admitted into the bag, and "the pressure folds " the brim over."

The form is composed of a base; two metal strips fixed on the top of the base, one on each side; two end moveable brim pieces between the strips; and two side brim pieces. For hats having crowns larger than the part which fits the head, the base is made to separate into two parts.

The curl of the brim is set by ironing it on a block "which " has a shallow recess formed in it into which the brim fits."

The edge of the brim is pared by aid of a ring or template, a sharp-pointed knife, and a "chisel-edged cutter, one angle of "which is ground off or blunted so as to allow it to press on the "part of the brim which is under the edge which is to be cut "off."

[Printed, 1*s.* 10*d.* Drawings.]

A.D. 1862, April 11.—N° 1044.

MATHIAS, JULES FRANÇOIS.—"An apparatus for pressing and "ironing straw hats of any shape or form." A circular plate is bolted on to the top of a cast-iron frame. The plate carries a metal block on which the hat is placed and a stand to which is jointed a block covering. Both block and covering are heated by steam, and the latter is provided with "an escape cock" to drive out the air and "a purge cock" to let off the condensed water. The covering has a sheet of india-rubber secured to it by a metallic plate and screws; it is worked by a handle and a counterpoise.

A straw hat being placed on the block, the workman brings down the covering, and the sheet of india-rubber "is brought "over the hat, the form of which it embraces closely." The workman also by means of a lever connected with gearing causes keys to enter mortises in the arms of the covering, so as to lock the block and covering together "when the steam is introduced "over the india-rubber sheet." The workman gives what pressure he pleases "by opening more or less the admission cock," and a gauge on the top of the apparatus indicates the amount of the pressure.

The patentee claims "as the most important part" of his invention the use of the india-rubber sheet, thereby avoiding contact "of the outside of the hat with any metallic surfaces."

[Printed, 10*d.* Drawing.]

A.D. 1862, April 15.—N° 1080.

BENNETT, THOMAS HARPER.—"Improvements in the manu"facture of hats, caps, and other coverings for the head." The object of this invention is "to prevent the exudation of grease, &c. passing from the hat leather through the hat body, and to form at the same time "to a certain extent a ventilating me"*dium.*"

This is effected by " a combination formed by a drummed per-" forated leather and a grease-absorbing material," such as prepared cotton, flannel, felt, horsehair, sponge, or other suitable substance.

The drummed leather is perforated in lines of holes at that portion which presses against the forehead. Above the perforations a strip of the material is placed between the leather and the hat body. The hot air escapes between the leather and the body and issues through the crown " by any of the known con-" trivances for that purpose."

[Printed, 4*d.* No Drawings.]

A.D. 1862, April 21.—N° 1157.

MARKS, Abraham.—(*Provisional protection only.*)—" Improve-" ments in artificial feathers applicable to certain ornaments of " dress." These feathers are intended as a substitute for ostrich feathers; they are " suitable for forming head dresses, the Prince " of Wales' plume, hat, cap, and bonnet feathers, or similar " devices."

Goose and swan feathers, separately or in combination, cleansed and rendered soft and fit for being coloured, curled, or otherwise embellished, are sewn or otherwise held together through the medium of a stalk or stem; they are then " shaped and finished " as required."

[Printed, 4*d.* No Drawings.]

A.D. 1862, April 24.—N° 1198.

TRAVERSIER, Joseph Adolphe. — (*Provisional protection only.*)—" Improvements in making ladies' bonnets." The frames of the bonnets are so constructed that " their volume may be " instantly reduced." The frame is composed of wire " united to " hinged and spring branches " which allow of opening and closing the bonnet. Each bonnet is provided " with a pin which " keeps it on the head."

[Printed, 4*d.* No Drawings.]

A.D. 1862, May 3.—N° 1305.

MOSSMAN, William.—(*Provisional protection only.*)—" Im-" provements in the manufacture of bonnets, hats, or coverings "for the head." The inventor uses enameled cloth in the manufacture of these articles. The cloth may be made of any woven fabric spread over with any suitable pigment of any colour; it may be applied "in pieces, shapes, or lengths, to imitate straw, "chip, crinoline, Leghorn, willow, and the like."

[Printed, 4*d*. No Drawings.]

A.D. 1862, May 7.—N° 1361.

MARKLAND, Thomas.—"Improvements in wearing apparel." This invention relates to a mode of ornamenting and preserving the edges of hat brims, shirt collars, and various articles of dress, by means of "a beading composed of china clay" or other similar material.

The beading is made in lengths of suitable curve and is slotted longitudinally, the slot having an enlargement inside for the reception of the edge of the article which is enlarged by means of a cord.

For attachment to collars "a broad tape may be employed," which has been prepared for the purpose "by having a cord or "enlarged selvage formed upon one edge."

The beading can be "removed at the wearer's pleasure."

[Printed, 6*d*. Drawing.]

A.D. 1862, May 9.—N° 1390.

MACE, Thomas Kemp.—"Improvements in guards or protectors "for hats and other coverings for the head." This guard is intended as a substitute for the ordinary cord used to retain the hat; "when by wind or otherwise it is removed from the head."

The guard consists of a small flat circular box (similar to that of a measuring tape) having inside a reel, whereon is wound a tape or cord. The reel may be turned by a winch or by making one side of the box capable of rotation; or it may carry a coiled spring, "as in the spring measuring tape." The projecting end of the tape or cord is provided with a ring for making a loop and with a button or stud to prevent the tape or cord from being drawn into the box. The box is fixed either inside the crown or on the underside of the brim; in the former case the tape or cord may pass between the body and the lining. There may be a ratchet or check inside the box to prevent the tape or cord from "running into its case before required," or for fixing it at any required length. The box may be perforated and serve as a ventilator.

[Printed, 8*d*. Drawing.]

A.D. 1862, May 10.—N° 1403.

CLARK, William.—(*A communication from Jean Louis Abeilhou.*)—" The application of a vegetable fibre alone or in combi-" nation with other matters in the manufacture of felted and " other fabrics, also a substitute for flock or powdered wool, and " as a material for padding or stuffing, and for other useful " purposes." The patentee utilizes the down of " aquatic plants " technically termed typha, and commonly known as reeds or " bulrushes."

When the down is sufficiently dry, it is separated from the seeds, worked until it possesses the fineness of silk, mixed with one-third or one-half the quantity of hare's or rabbit's or beaver's hair, and felted. This felt may be used for shakos, hats, caps, hat bodies, and linings, and " for all kinds of head dresses, civil, " ecclesiastic, and military."

The down may be woven by mixing it with " silk, wool, cotton, " flax, China grass, or other fibre," and may be used in the manufacture of shawls, gloves, trousers, drawers, lace, trimmings, and " coverings for the feet."

[Printed, 4*d*. No Drawings.]

A.D. 1862, May 15.—N° 1474.

TRESS, Cooper.—" Improvements in the manufacture of hats, " helmets, bonnets, or caps." Hats, &c. constructed according to this invention allow currents of air to pass from the exterior to the interior " above and surrounding the head of the wearer." The hat, &c. is formed by preference " from one piece of felt or " other material capable of taking the required shape from a block " of the required form." The upper portion of the crown " is " enlarged and in part double, the upper portion overhanging and " passing partially down outside and over the lower portion all " round;" the brim is formed " by an enlargement of the said " inner or lower portion." An air space is obtained at the top " by the insertion of a false crown or disc of cork supported from " the top or natural crown, suitable perforations in the inner " and outer portions of the sides and crown being provided for "ventilation." The hat leather is perforated round the top and has strips of cork "with vertical perforations" round the bottom.

The block required is made "in pieces to separate and fasten "with a centre key." Upon the block "one or more dipping or "rising flanges of metal are fitted," and a loose band of metal made to fasten with a stud and eyes is "used with and fitted to "the block." This band passes over the felt "under, up, and "down, between the dipping and rising flanges and the block "surfaces," and the hat is "thereby formed to the shape "required."

The felt, manufactured in the conical or other shape, is stretched downwards over the upper portion of the block and over the flanges. The band is put outside the felt and fastened as tightly as required, forming a sliding ring. The ring "is then forced "upwards between the projected flange and the sides of the "block, carrying the felt therewith," and forming cavities. The upper portion of the block is now placed on the lower one; "the "superabundant felt is then stretched downwards over the brim "block," and the edges are secured in a groove in the lower portion by clips or other means. The felt is softened, &c. in the ordinary way, the false crown and the leather are put in, and "the hat or other similar article is finally shaped, bound, and "banded ready for use."

[Printed, 6*d*. Drawing.]

A.D. 1862, May 31.—N° 1651.

NEWTON, WILLIAM EDWARD.—(*A communication from William Elmer.*)—"Improvements in the treatment of cloth and other "textures, leather, or animal tissues, for the purpose of rendering "them more durable and impermeable to water and other "fluids, and for producing from any firm fibrous texture, such "as cloth, cotton, woollen, or mixed goods, a durable artificial "leather." The first part of this invention applies to "wearing "apparel, as overcoats, cloaks, boots, shoes, hats, caps, or any "other article of clothing desirable;" the articles will be rendered waterproof, while the external appearance of the cloth side "will "retain all the original beauty and properties."

The material is first subjected to the action of "alumina or "*other* true mordant," preference being given to alumina. If *the material* has been dyed, and only one side is to be treated, care must be taken to prevent the alumina from penetrating and forming a deposit on the opposite side. The alumina is applied in the form of a solution, one part (usually the sulphate) to two parts by weight of gelatine (each previously dissolved), "so as to "form a thick solution or paste." The solution should be well worked into the texture of the material. When the material is partially dried at a temperature of about 100 Faht., a solution of tannin is applied. After the water from the tannin has nearly evaporated, the material is steamed, passed between rollers, again mordanted and carefully dried at a temperature of about 150° Faht. "in a well-ventilated room from which the sun's rays are "excluded." The material now receives a coating of india-rubber or gutta percha, or of the two combined; the preparation of this coating is described in the Specification. The coated material is passed between rollers, the one which comes into contact with the coated side being heated to from 250° to 300° Faht.; after this it is coated with a paste made of alumina one part and fish glue two parts (by weight), and when partially dried "it is "placed in contact with a strong solution of tannic acid or other "analogous substances for from 6 to 12 hours." The final processes are steaming for about 30 minutes, carefully applying "oil "of birch and naphtha or other analogous substances," and again steaming for about 30 minutes.

In preparing leather gelatine is not required, and "the surplus "oil and grease" is removed by means of benzole before the application of the alumina.

[Printed, 6*d*. No Drawings.]

A.D. 1862, June 4.—N° 1679.

CAHILL, Charles Staunton.—(*Provisional protection only.*) —"Improvements in the manufacture of felted fabrics, suitable "for hats, bonnets, and other purposes."

First improvement, a "method of preparing felted fabrics:"—A coating of varnish or other adhesive material is spread over a body of paper or paper pulp, or of woven fabric. Over this is applied a quantity of ground or properly prepared flock, wool, silk, cotton, or other fibrous substance. The flock, &c. "is then "pressed and worked to a proper surface."

Second, "means employed for depositing the felting" upon hats or other articles:—The article is placed on a rotating spindle.

A drum with frames covered with calico or other fabric or with wire gauze surrounds the spindle; it revolves "in a contrary "direction" and at a "right or oblique angle" to the spindle. The felting material is put into the drum; as it floats about and comes into contact with the article it attaches itself thereto and covers it.

The varnishing and depositing are repeated "until sufficient "substance has been obtained."

[Printed, 4*d*. No Drawings.]

A.D. 1862, June 7.—N° 1709.

HARDING, William.—(*Complete Specification, but no Letters Patent.*)—"Improvements in the manufacture of bonnet fronts, "and in apparatus to be employed therein." The improvements claimed are (1) producing fronts at less cost and labour; (2) allowing the pattern to be more varied than at present; (3) producing the gofferings "in a cold state."

The apparatus required consists of a stand or body carrying "raised projections for forming the required pattern," intervening spaces being left through which the lace or fabric is passed. The apparatus may be varied in form and construction, "or so "arranged as to admit of being readjusted" according to the work required.

The lace is "threaded through or passed round" the projections and held in position for banding and finishing.

[Printed, 8*d*. Drawing.]

A.D. 1862, June 24.—N° 1855.

JOHNSTON, James.—(*Provisional protection only.*) — "Im"provements in hats." The improvements relate to "the manu"facture of cloth hats or those in which the bodies are covered "with a woven fabric." These hats "may be subjected to any "amount of rain, or even be immersed in water, without injury "to their original shape."

The calico or similar fabric of which the body is formed is prepared with shellac, and a piece of the prepared fabric is laid on a piece of cloth of a size "suitable to form the under surface of "the hat." A piece of oiled cloth, paper, or other waterproof material, is placed on the upper side of the fabric, and the whole is put on a block, on which a heated mould descends and causes the materials to adhere together. The body is removed from the block, and the surface of the waterproof material is coated with shellac. The outer covering is now put on and caused to adhere "by submitting it to the blocking operation." The edges are then trimmed and bound, and the hat is lined.

[Printed, 4*d*. No Drawings.]

A.D. 1862, July 12.—N° 2010.

GEDGE, WILLIAM EDWARD—(*A communication from Pierre St. Spés.*)—(*Provisional protection only.*)—"Improvements in the "manufacture of hats." The body is made of felt prepared in the usual manner but of lighter weight than ordinary; it is blocked to form, care being taken "to burn off with the blocking "iron all the hairs and leave a polished surface." The body is then covered with three coats of gummy solution and one of varnish, after which the outer covering is drawn on.

[Printed, 4*d*. No Drawings.]

A.D. 1862, July 28.—N° 2127.

WALTON, JOSEPH, and MOORE, JAMES.—"Improvements in "the mode of ventilating and heating rooms, Turkish baths, hot-"houses, and buildings of all kinds." The patentees apply their invention to the ventilation of hats also. The apparatus which they employ for this purpose consists of (1) a conical tube, by means of which hot air "is admitted and carried off into the outer "atmosphere" through (2) small tubes fixed horizontally near the top of the conical tube; (3) an outer tube having a flange to connect it to the hat crown, and (4) a cap to prevent rain from gaining entrance to the hat; (5) a regulator with openings in the side, by means of which the ingress of fresh air into the hat can be regulated. The regulator surrounds the lower portion of the outer tube.

The above apparatus when applied to ventilate rooms, &c. admits of modifications which are explained in the Specification.

[Printed, 1*s*. 2*d*. Drawings.]

A.D. 1862, August 9.—N° 2236.

BOUSFIELD, GEORGE TOMLINSON.— (*A communication from James Seeley Taylor.*)—"Improvements in apparatus to be used

" in the manufacture of hat bodies," namely in the process of " picking and blowing fur " in the formation of hat bodies.

An inverted perforated cone is suspended in a revolving metal ring on the top of a chamber (usually "square-shaped"). On one side of the chamber is an opening in which is placed a revolving fan for exhausting the air from the chamber. On the top of the chamber is an iron frame with an opening in the top, and the ring is fitted in the frame so as to turn freely by means of a pinion which takes into teeth on the edge of the ring. A washer between the frame and the chamber prevents air from entering, except that which is drawn "through the cone in the opening on the top."

The picking apparatus, consisting of a feed apron, feed rollers covered with cloth, and a picker, is supported on a frame which is so constructed that the rollers and pickers can be raised or lowered at the will of the workman. Over the picker is a cap to prevent the fur "from being thrown back over the feed apron."

The whole machinery "is connected with belts and gearing" usual in such machinery.

To remove the hat body another cone similarly perforated "is " dropped down into the cone" in which the body is formed, thus holding it between two cones and rendering it unnecessary to place cloth over the body to prevent injury to it "during the " process of immersion."

[Printed, 8*d*. Drawing.]

A.D. 1862, August 18.—Nº 2319.

MELTON, Henry.—(*Provisional protection only*.)—" Improve- " ments in the manufacture of hats and caps." These articles are made with "their surfaces reversible," a cloth or woven surface for fine weather, and a waterproof surface for wet weather. The article is formed "with a double crown and rim," one of cloth or woven fabric, the other of waterproof material. Each is " to be sewn at opposite ends of the body" to the extent of " half the circumference," and then "the two remaining halves of " the crowns are to be sewn together so as to form one piece, pre- " senting a cloth surface on one side and a waterproof surface on " the other, which may be drawn over either of the halves of the " crown and rim which are sewn."

To facilitate the movement of the reversible portion of a cap a *gusset is* made on each side, and an elastic cord keeps the gusset *closed*.

[*Printed*, 4*d*. No Drawings.]

A.D. 1862, September 6.—N° 2463.

HUGHES, Hesketh.—" An improved frilled and fluted fabric " or material, and improvements in fluting or goffering ma- " chines." This fabric may be all of one colour or of different " colours, and may be made of similar or dissimilar materials." The material which is to form the edge or edges of the fabric are goffered " in a goffering machine with plaits or goffers," and the bottom edge is sewn or cemented " to one edge of the material " which is to form the body." Both edges may have goffered material sewn to them, or one may have " a piece of plain material " sewn to it." The body and the goffered edge are passed through a machine similar to the one for which letters patent were granted to Mr. Hughes on May 29th, 1860, No. 1327, " but with leaves " or pattern formers so made as not to injuriously affect the " already goffered edging;" this produces " a fluting or goffer " across the whole fabric." One or more rows of stitching are run " through and along the fabric " in order to preserve the fluting.

Sometimes the goffered edging is applied in rows on the body; the leaves or pattern formers are cut away in parts " to prevent " them acting on the goffered edges further than causing them " to follow the fluting imparted to the fabric."

Sometimes a strip of material is goffered entirely across and flattened except at the edges; the goffer is secured in the edges; a strip of fabric is applied between the goffered edges; and the fabric is fluted in a machine as before mentioned.

The improvements in the goffering machines consist in " adapting the leaves or pattern formers to produce the improved " fabric described " and in " forming the links or loops of the " endless chain in such machines each of two separate plates of " metal." Each plate is made at the top in the shape of a hook with a rounded head and at the bottom with two apertures for attachment to the machine. Two such plates " are brought " together in opposite directions and riveted to each other, the " hooks being turned towards each other." A space is left in each link for the pattern former.

[Printed, 8*d*. Drawing.]

A.D. 1862, September 29.—N° 2650.

CARRICK, William, and CARRICK, William, the younger. —" *Improvements* in felting apparatus." A metal vessel or vat

" with curved ends" so as " to facilitate the turning of the goods " during the operation of the pressers," is lined with wood. Pressers (one or more) consisting of blocks of wood are suspended in the vessel near their lower extremities by links " let into slots." The links are pinjointed to the pressers and vibrate freely upon fixed centres in the upper part of the vessel. In the bottom of the vessel are slots, through which work arms " secured one to " each presser and protruding some distance below the bottom." Rods jointed to the arms are coupled at their other ends to adjustable cranks which are carried by the driving shaft. The goods are introduced through covers placed over openings in the upper part of the vessel.

" On imparting a rotatory motion to the shaft" the pressers " will be made to vibrate or oscillate in opposite directions and " will produce a felting or milling action " upon the goods in the vessel.

A single presser may be employed, but it is preferred to use two, " as their action is thereby rendered continuous."

[Printed, 8*d*. Drawing.]

A.D. 1862, October 7.—N° 2709.

WELCH, John Davis, and WELCH, Alfred Phippen.—(*Provisional protection only*.)—" Improvements in machinery for " blocking and pressing hats and bonnets." An iron table, hollow to admit of its being heated, is mounted on four standards. The standards are continued upwards and serve as guides for the ascent and descent of an iron dome. The lower part of the dome carries a diaphragm of india-rubber secured air and water-tight round the internal periphery thereof. A pipe is screwed on to the top of the dome, " by which means hot or cold water or air or other fluid " may be forced into the dome." The surface of the table and the edge of the dome " should be ground and polished so as to " fit after the manner of an air-pump receiver."

A suitable block with a hat or bonnet thereon being placed on the table, the dome is allowed to slide down until the diaphragm encloses the article; the dome is held down by clamping screws or other fastenings; hydraulic or pneumatic pressure is applied through the pipe, and the diaphragm " will be extended, stretched, " and forced down on to the outer surface " of the article and so " give it the requisite pressure and shape." The block may be heated; and the article should be damped, and a hood of felt, flannel, or leather, be placed over it before it is pressed.

[Printed, 4*d*. No Drawings.]

A.D. 1862, October 16.—N° 2795.

DELMAS, Florentin.—(*Provisional protection only.*)—" A rain " absorber," to prevent rain from running down from hats, caps, umbrellas, and other articles round which it is placed. The absorber is formed " either of uncovered sponges or of sponges " covered and connected by any kind of tissue or textile fabric." The sponges are united by one or more cords passing round or through them. The absorber can be readily removed from the article, squeezed, and replaced; it can have a veil attached to it for ladies' hats and bonnets.

[Printed, 4*d*. No Drawings.]

A.D. 1862, October 18.—N° 2812.

BENTLEY, John.—" Improvements in apparatus for forming " and pressing felt hats." The first and second improvements relate to the lid and to its hinge; the third to a " mode of apply-" ing the india-rubber or elastic bag;" the fourth to the " mode of " securing the cover or lid to the body of the apparatus;" the fifth to " forming the basin or mould in two or more separate parts;" and the sixth to " the application of a gauge of a peculiar " construction for indicating the pressure of the water when the " apparatus is in use."

A vessel of cylindrical form and open above receives the mould; " it also comprises within it a steam chamber." Two brackets are attached to the lid; they pass between two arms secured to the vessel. A perforated spindle passing through the brackets and arms forms the hinge on which the lid turns. A lever at the end of one bracket carries an adjustable counterweight " to about " balance the lid." On the spindle is " a packed joint " so that the other bracket " can move water-tight " on the spindle, and within the joint " is an opening into the interior " of the spindle; a corresponding passage is made through the bracket " to the " under side of the lid." At one end of the spindle is a cock or valve from which a pipe leads to the lower part of the " pressure " vessel," and at the other end a cock or valve from which a pipe leads to the " water cistern."

The bag is made with a flange whereby it is secured to the under side of the lid by means of a hoop.

The lid is secured to the vessel when the apparatus is in use by "three radial bolts" which take into projections on the vessel; the bolts are moved by a cam plate in which are "three eccentric "grooves" taking into pins on the bolts.

The mould, for hats with round crowns, is made of a single piece; for hats with flat crowns of separate pieces hinged together, with beveled surfaces on the outside "forming rings round it;" there are corresponding beveled surfaces "in the interior of the "chamber in the vessel." When the mould is made in separate pieces, it is removed from the chamber in the vessel by placing the foot on a lever, which causes a rod to rise up through a hole in the bottom of the vessel.

The gauge is connected with the pressure vessel; a piston rod carries near its upper end a collar and a worm spring; it passes through a bracket; the spring is compressed between the collar and the bracket; and the amount of pressure is indicated on a scale "by an index attached to the collar."

The mode of working the apparatus is described in the Specification.

[Printed, 10*d*. Drawing.]

A.D. 1862, October 21.—Nº 2840.

TRESS, COOPER, and BELHOMME, FRANÇOIS CYRILLE.—"Improvements in hats, caps, bonnets, and other coverings for "the head." These articles are "flexible and soft to the wearer;" they are "capable of being crushed or folded up" and sufficiently elastic to recover their original form; and they are made "venti-"lating and waterproof."

The inside lining is composed of any suitable soft material and gutta percha or other substance of the same nature; these "with "or without any suitable elastic fibre in combination therewith" are cut to the required shape, placed on a block, and caused to adhere by the application of heat, thus forming a body for the article. "A little mellow proofing" may be applied in such parts as may require it.

The first covering is of sheet gutta percha. Ventilation is obtained "by suitable perforations;" and elasticity is increased by the use of "any suitable elastic matter," which may be introduced during the process of manufacture or afterwards "as may be found "most convenient." The final covering is of silk, felt, beaver, &c.; the whole is "made to consolidate well together" by the further application of heat; and the article is then finished off.

[Printed, 4*d*. No Drawings.]

A.D. 1862, November 6.—N° 3003. (* *)

GOODYEAR, Frederick.—(*A communication from Ambrose Claraz.*)—(*Provisional protection only.*)—"A machine for plaiting "straw and such like material."

This machine is described as follows:—

"This invention consists in the use and adaption of certain "means or mechanical arrangements for effecting the plaiting of "straw and similar material as if plaited by the human fingers."

The means or mechanical arrangements are as follows:—"Upon a sole plate I mount a framing and support a roller with "a number of curved projections. This framing supports a table "having thereon, first, a holder for the straw to be plaited; under "this holder the straws are laid by lifting this holder by a lever "or other such suitable machine. When the straws have been "duly entered, the roller is to be turned by a winch handle, and "then, upon one portion of the circle described being reached, "the roller acts upon upright rods or risers coming through the "table secured free to move in pendent bearings attached to the "under side of the table. These rise or lift up such of the straws "as may be needed for effecting the plaiting. On another part "of the circle of motion being described, the roller acts upon "levers depending underneath the table and acting against the "appointed projections on the roller aforesaid, and cause pressing "levers or fingers to push down such of the straws as are required "to be pressed down to make the plait; a further portion of the "circle of motion being reached, plaiting pieces attached to the "table are, by means of the roller aforesaid acting on pendent "levers, caused to rise and move forward and plait other of the "straws, and then a still further portion of the circle of motion "being reached, a flattener on the end of a lever acted upon by the "roller in similar manner as before described, comes into play, "and also a driver or beater up of the work which slides at the "middle thereof, and hence one portion of the plait is produced, "and the same operations being repeated, a whole length will

" be made. The plait, when finished, descends through a pipe " provided for the same, according to the character of the plait; " as to the number of straws used, and so forth, so will the number and position of the various parts be varied accordingly."

[Printed, 4*d*. No Drawings.]

A.D. 1862, November 26.—N° 3173. (* *)

AUSTIN, WILLIAM.—(*Provisional protection only.*)—" An improved material for the manufacture of cartridge cases, appli- " cable also for tubing and various other useful purposes." The material consists of a woven fabric coated with any adhesive or waterproof adhesive solution, covered with a layer of paper on one or both sides, and then subjected to pressure either by rolling or by flat or other pressure hot or cold. Or a paper pulp, waterproofed or not, may be spread on each side of the fabric, and subjected to hot or cold pressure. Instead of a woven fabric fibres of various descriptions may be intermixed with pulp or laid between sheets of paper and treated with waterproof solution. To produce a thick substance several layers may be pressed together; in all cases the exterior surface may be lacquered or varnished.

The material is suitable for making hats and bonnets as well as other articles.

[Printed, 4*d*. No Drawings.]

1863.

A.D. 1863, January 20.—N° 175.

HUGHES, HESKETH, and SANDERS, JAMES.—(*Provisional protection only.*)—" Improvements in machinery and apparatus " for the manufacture of trimmings and cap fronts." A roller having two grooves along its whole length rotates in a frame. In each groove are placed two strips of net or other foundation covered with gum or other adhesive matter; or gummed thread may be laid on the strips. Parallel with the roller is a threaded shaft to which as many ribbon-carrying bobbins are connected as there are different ribbons to be used.

By fixing one end of the ribbon on the roller and by causing the roller and shaft to revolve, " the roller will wind on itself the " ribbon from the bobbin." When the ribbon is wound on, a cutter " is run along each of the grooves and the ribbon thereby severed." The fabric will be " in the form of two sets of strips " of ribbon, the ends of which will be united to the two longitu- " dinal strips of gummed foundation." The drying may take place before the cutting or afterwards. " The strips of ribbon " being doubled or folded, the two foundation strips are brought " one over the other and are secured by a banding machine or by " sewing."

For inserting " goffered net " between the ribbons an apparatus is used " made with flaps to fold over and hold down the founda- " tion strips " whilst the net is being inserted. A " hinged " making-up box " receives the strip of ribbon, and a guide is required for the insertion of the net. " The protruding edges are " caused to adhere by means of a heated press."

[Printed, 4*d*. No Drawings.]

A.D. 1863, January 23.—N° 209.

STOPFORD, Charles.—" Improvements in the construction " of hats and other coverings for the head." A band is attached by its lower part to the interior of the ordinary band of the hat. The upper part of this internal band is left loose and unconnected with the side crown, so as to leave a space for a passage of the air admitted through perforations in the band. At the top of the hat is an aperture covered with pervious material, through which the heated air can escape. The perforations in the band of the hat may be covered externally by a band of pervious material.

[Printed, 4*d*. No Drawings.]

A.D. 1863, February 13.—N° 394.

HODGE, Oliver Hicks.—" Improvements in hat brims, in " the manufacture of hat brims, and in the apparatus or machi- " nery used in such manufacture." The component parts of the brim are so arranged " that the greatest strength and thickness is placed where required, and the edge rendered light and tapering." The stiffening liquid is applied " to only those parts of the ma- " terial requiring stiffening."

The apparatus used consists of (1) a frame capable of rotating upon a fixed part; (2) a mould or pattern plate "formed so as to "exhibit on a flat and square or oblong surface a number of "openings," each "corresponding in outline to the brim to be "manufactured;" the mould is furnished with brackets and spindles which fit into and work in slots in the upper part of the frame; (3) a stretching frame "fastened in proper position by "buttons or pins" on the mould; (4) a pan or tray to hold the stiffening solution; it is furnished with a plate perforated "to "facilitate its up-and-down movement when submerged in the "stiffening liquid," the movement being effected "by means of "a spring treadle arrangement;" (5) a cutting apparatus composed of an upper and a lower part (which are united by a centre stem, screw, and nut) and circular cutting plates which are placed between the parts.

Pieces of calico saturated with a weak solution of stiffening are stretched upon an ordinary frame. Layers of different sizes are cut out by the cutting apparatus. The layers are resaturated in the pan with a stronger solution, and are then arranged upon strained material on the stretching frame "so that the edge "of one shall fall within that of the other and thus form the "light and tapering edge desired." A piece of the material is strained over the arranged pieces, "and a second mould or "pattern plate is applied and fixed upon the upper surface of the "material," so that each of the strained pieces has a mould applied thereto "which covers those parts not required to be stiffened." The exposed parts are supplied with the necessary quantity of stiffening liquid; the moulds are then disconnected, and the brims are "placed to dry."

The patentee describes a modification of the foregoing process which he can use "when desired."

[Printed, 10*d*. Drawing.]

A.D. 1863, February 23.—N° 490.

WELCH, JOHN DAVIS, and WELCH, ALFRED PHIPPEN.—"Improvements in machinery for blocking and pressing hats and "bonnets." Standards are bolted to a bed plate; they support a hot water vessel surrounded by a jacket into which steam is admitted. In the upper part of the vessel is a pipe through which water is forced into the vessel; the bottom of the vessel is furnished with a disc of vulcanized india-rubber "hanging slack "in the form of a bag." Below the vessel is the situation for the block or mould, "for by this invention," say the patentees, "we "apply pressure either externally or internally, or both externally "and internally."

For internal pressure, the mould (of cement, clay or other plastic material, glass, &c., with "a hard smooth face") is set in an iron conical pan which is placed in a suitably shaped iron heating chamber. The chamber stands on the table of a horizontal bar, and the table working on a pivot can be "turned outwards and forwards from the machine" by a handle. The bar is raised or lowered between the standards by means of a rack and pinion; a counterbalance weight steadies the descent of the mould and chamber, and stops hold them in position when raised.

For external pressure a raised block or mould (of similar material to the one before described) is formed on an iron base; "the iron serves as a foundation for the block and strengthens "it." The block is hollow in order that it may be placed over a conical iron steam chamber on which it fits.

The blocks or moulds can be changed "with great facility;" and the "facility afforded by the construction of any number of "moulds and blocks of plastic material effected by this method "is a main feature of the invention."

The patentees explain the operation of the machine for internal and for external pressure.

[Printed, 10*d.* Drawing.]

A.D. 1863, February 24.—N° 502.

GEDGE, William Edward.—(*A communication from Guillaume Madelaine Lacaze.*—(*Provisional protection only.*)—"Improvements in the manufacture of hats." The hat body is made of "silk stuff" saturated with a stiffening composed of "gum lac "and gum elemi dissolved in about equal proportions of spirits "of wine." It is then stretched on a frame; any impurity or shade left by the stiffening is washed off; and the glossiness of the stuff is restored. The tip and brim are then cut and placed on the form, "putting only a strip of gauze as a band where the "junction of the plush is to be made." Varnish or other coating is then applied to the body thus made, and any suitable substance is glued over all.

The principal improvement is "the composition of the prepara-" tion or stiffening applied for the first time to the silken stuff;" it "permits the restoration of the hat to its original shape, no " matter what crushing it may have received, and that on a " simple shape or block."

[Printed, 4*d*. No Drawings.]

A.D. 1863, February 26.—N° 547.

NODDER, Richard Joseph.—"Improvements applicable to " hats, caps, helmets, military head dresses, and other like cover-" ings for the head." A "peculiarly constructed zone, band, or " ribbon" is connected by its lower edge to the lower edge of the interior of head coverings behind the ordinary leather.

The upper portion of the warp of the zone is formed "of thin " metallic wires or other suitable material that is pliable but non-" elastic in its length;" the lower portion and the whole of the weft are of silk, cotton, or other suitable soft substance. The metallic portion "is of a little less diameter than the internal cir-" cumference" of the head covering, so as to form "an elastic " or pliable but not a stretching circlet."

To obtain "a slight galvanic action" the wire portion is made of two metals, say, copper and zinc.

For ventilation small holes are formed at or near the lower edge of the lining, and one or more apertures in the body or the crown.

[Printed, 8*d*. Drawing.]

A.D. 1863, February 28.—N° 563.

ROYLE, George.—(*Provisional protection only.*)—"A new or " improved apparatus for creasing or making rouches." An endless band is stretched over two rollers; it has "ridges formed " across its outer surface corresponding in form with the corruga-" tions of the goffered rouche." At a certain point in the width of the band a longitudinal groove is made right along the same. A portion of the band between the rollers moves over the surface of a flat table; and immediately above the groove, in that part of the band which is upon the table, a metal plate is placed in a vertical position. An up-and-down motion is imparted to the plate, which is guided by framing attached to the table. When the plate is "in its upper position," its lower edge is heated by gas jets, and when it is "in its lowest position," the heated edge enters the groove of the band.

"The mechanism for imparting the relative motion of the end-"less band and of the heated plate" is so arranged that as the latter performs its upward motion, the former moves along the table "to an extent equal or nearly so to the length of the heated "edge of the plate," whilst when the plate moves down and enters the groove, the band "remains stationary upon the table."

On one side of the band is a water-trough "equal in length to "that of the heated edge of the plate;" it "has a narrow opening "right along it, filled in with sponge or cloth, through which a "small amount of moisture passes, which is communicated to "a stretched tape or band carried by two rocking levers." The levers bring the tape "first against the moistening apparatus and "then down over the endless band exactly over the groove."

The inventor describes the operation of his apparatus.

[Printed, 4*d*. No Drawings.]

A.D. 1863, March 11.—N° 661.

COOKE, FREDERICK.—(*Provisional protection only.*)—"Im-"provements in the manufacture of hats or coverings for the "head." This invention "is designed to produce a sharp, "angular, and well-defined edge at the junction of the crown "with the sides."

An india-rubber or other elastic "crown core" is formed "with "an angle corresponding to the mould in which the hat is made;" it is fitted into the crown of the body when in a pliable state, and pressure is applied thereto by means of water, "as at present used "in making felt hats," or by other means. The core is thereby caused to expand and press the felt or other material "into the "angle of the exterior mould" and "produce an angular junction "between the sides and crown of the hat."

[Printed, 4*d*. No Drawings.]

A.D. 1863, March 18.—N° 733. (* *)

WELCH, JOHN DAVIS, and WELCH, ALFRED PHIPPEN.—(*Provisional protection only.*)—"Improvements in bleaching and "in reducing and brightening the color or tone of dyed straw "plaits and straw." These are, subjecting "the straw plaits or "straw to the action of vegetable dyes dissolved in boiling water,

" for instance, to a solution of cudbear and shumac in equal " proportions, or to any other vegetable dye, according to the " tint of color required." "After the straw has taken up the " dye," it is proposed "to subject it to the action of a hot solu- " tion of carbonate of potash or salt of tartar about two parts, " salt of sorrel about half a part, and oxalic acid about one part " to each gallon of water, which should not be allowed to reach " the boiling temperature." "After being treated for one hour " by the above solution," "the straw plaits or straw should be " subjected to the strong fumes of burning brimstone in an " ordinary steam chamber for about two hours, after which it " should be allowed to dry, when the straw will be found to have " acquired" "light shades and neutral tints." "The propor- " tions of the carbonate of potash may be varied; the object " should be to employ just sufficient potash or tartar as to nearly " neutralize without destroying the acid."

[Printed, 4*d*. No Drawings.]

A.D. 1863, April 10.—N° 908. (* *)

SHELMERDINE, Samuel, and DRANSFIELD, John.—" Improvements in the ornamentation by printing of felt hats." The invention consists in making "the felt hat body in the shape " of a cone," and then printing or staining "any desired pattern or " ornament" on the cone-shaped body " by the block or machine " printing operation, printing first one side of the cone and then " the other, thus giving the necessary ornamentation instead of " making the hat in sections or of different portions of fancy " materials," and then blocking "the body of the required shape " or configuration in the usual way." "In order to facilitate the " operation of printing the said cone-shaped felt hat," it is passed " between two or more revolving rollers to give it two flat sur- " faces," and afterwards placed in a press "to give the flat " surfaces a greater amount of solidity." These hats are printed " either in the self color," or they are stained or dyed previous to printing.

[Printed, 4*d*. No Drawings.]

A.D. 1863, April 21.—N° 988.

***SIMPSON*, Edwin Lindsey.**—"*An improvement in waterproof " compounds*, and in fabrics prepared therewith." This compound may be applied to "hat bodies, bonnets, and for coating " wire for crinoline;" the fabrics "are peculiarly adapted for the " manufacture of clothing, boots and shoes, and for all articles " where a waterproof quality is desirable." To prepare the compound, melt together over a slow fire 2 parts of gutta percha and 3 of camphine or naptha, and set the mixture aside to settle and cool. For delicate tints, thin the mixture when partially cooled with camphine or naptha. Prepare a drying oil by boiling linseed or other vegetable oil over a slow fire "until it attains the con-" sistency of jelly;" when sufficiently cool, add to four gallons of the oil 1 ounce of purified benzine, 3 gallons of camphine or naptha, and 3 gallons of the mixture. If a black colour is desired, mix lampblack in the oil; for other colours, use the requisite colouring matter. Less camphine is required when the compound is mixed "by grinding between iron rollers" than "by stirring or " agitation."

The compound when "thoroughly cool or not above 70°" is applied to fabrics by any suitable means; three coats are sufficient for ordinary cloths, two for silk or thin goods.

When the coats are thoroughly dried, they require a finishing coat or varnish, composed of 1 gallon of drying oil and 4 ounces of red lead (or their equivalents) boiled together, "until it will " string two or three inches," with the addition of 1 quart of camphine or naptha and 1 quart of the gutta percha mixture, " when it has cooled sufficiently to allow it."

Fabrics thus prepared may have "a coating of flocks" applied to them while the varnish is in an adhesive state, or afterwards by softening the varnish with camphine or naptha.

[Printed, 4*d*. No Drawings.]

A.D. 1863, April 27.—N° 1047.

CARCHON, Hilaire Emile, and RAYBAUD, Eugéne François.—"Improvements in the manufacture of hats and " bonnets, and mode of preparing feathers to be used in the said " manufacture." The patentees substitute "the outer covering " or surface of the backs of the stems of feathers" for the straw and other materials used in the manufacture of hats, bonnets, crinolines, and similar articles, "where lightness, elasticity, and " durability are required."

The back of the feather is carefully stripped off and cut to the required length and thickness; it is then plaited and made up in the same way as straw.

[Printed, 4*d*. No Drawings.]

A.D. 1863, May 28.—Nº 1344.

WHITE, HENRY THOMAS.—(*Provisional protection only.*)—" Improvements in hats, caps, and other coverings for the head." The inventor secures a pad made of cork, felt, or other suitable substance, " round the inside of the hat under the lining from one " temple to the other round the back of the head," leaving a space in front about equal to the width of the forehead.

By this means there will not be any pressure on the forehead, and a space will be left between the forehead and the hat, " so " that air can pass up into the interior of the hat."

[Printed, 4*d*. No Drawings.]

A.D. 1863, July 15.—Nº 1773. (* *)

HENRY, MICHAEL.—(*A communication from the Société Trotry Latouche, Frères.*) — " Improvements in figuring, ornamenting, " and coloring fulled and felted fabrics and articles." These are, subjecting the fabric or article to a process consisting of the following stages :—" In the first stage, the article or fabric is " dressed, teazled, or rowed by a gig mill or other teazling or " rowing machine, and it is then sheared or clipped." These operations are repeated alternately, " as often as required, till the " desired nap or pile is raised." " The article or fabric is then, " in the second stage, embossed, stamped, or printed with a device " or design by means of engraved surfaces " (with or without colour), " to which the nap, pile, velvety, or flock side of the " fabric or article is applied," " a cushion or pad being placed on " the reverse and pressure applied preferably by a hydraulic press " with its lower plate heated by steam, or instead of plates engraved rollers may be used." " In the case of hats and other " hollow or shaped articles " " an engraved surface, mould, or " shape is employed, engraved on the inner side, and of a form " corresponding to that of the article to be figured or ornamented." Into this mould the hat, &c. is inserted, and within that is placed an elastic pad or block, to which pressure is applied, whereby the device or design is produced. "After the second stage the fabric "or article is subjected to the third stage, in which the relief of "the device or design is rubbed with rollers or other appliances "formed of or faced with pumicestone, emery, glass powder paper, "scouring paper, or other wearing or rubbing surface, which partially removes or wears away the relief." "After beating the "fabric or article to expel dust, it is subjected to the fourth stage, "that is to say, to the action of steam, whereupon the relief will "vanish and the reverse of the design will stand out or present "itself. Fabrics and articles so treated may be passed through "hot or cold water without losing shape or pattern." "When the "pattern or design is in two or more colours the article or fabric "is printed in as many colours as required before the first stage "and is then washed and subjected to the four stages above "described." "Shaded grounds may be obtained by applying to "the drest or prepared surface of the article or fabric, after the "first stage, a thin printing dye without figuring, and after fixing "this the fabric or article is subjected to the three remaining "stages, but should be washed before steaming. To ornament, "dye, or print articles or fabrics in colours they are treated with "the four stages described, except that the printing or stamping "plates, rollers, moulds, or surfaces are not engraved, but they "may be varnished to retain the colour. In preparing waterproof goods the waterproof coating should be applied between "the first and second stages."

[Printed, 4*d.* No Drawings.]

A.D. 1863, July 17.—N° 1794.

DURST-WILD, Anne Catherine.—(*Provisional protection not allowed.*)—"An improved mode of producing raised patterns, "figures or devices on felt hats, caps, and bonnets." A "felted "conical hood or cap," impregnated with any gummy, gelatinous, or resinous solution is stretched over a conical block. A corresponding block, with the pattern to be produced (either in relief or intaglio), is then applied, and the whole is put into a heated mould and subjected to hydraulic or other pressure.

The hood, being taken off so as to be "turned inside out," is put on to another block, "for the purpose of pouncing or shearing "from the surface of the felt the raised parts." It is then cleared of the stiffening solution and moistened, when "the pressed or "embossed parts of the patterns, figure, or device, by swelling out

" or extending to their original or natural state, will rise above " the remainder." The hood is then ready for "any of the operations required for manufacturing the same into a finished hat, " cap, or bonnet."

[Printed, 4*d*. No Drawings.]

A.D. 1863, August 18.—N° 2052.

BROOMAN, Richard Archibald.—(*A communication from Eugene Coanet.*)—"Improvements in the manufacture of hats, " caps, and bonnets, and in apparatus employed therein." A principal apparatus, called "a mechanical dresser," and "two " accessory apparatuses," one for folding the brim, the other for shaping the brim, are employed.

The dresser "is in the form of a strong press." The main shaft is threaded, and carries a toothed wheel "driven by a long " pinion." The shaft "carries at bottom a moveable pressing " plate," covered underneath with felt or other suitable substance. A form or matrix heated by steam is fitted into the top of a hollow case, which is set on wheels and runs on rails to facilitate the placing of the matrix under the pressing plate. "A small steam " generator" is placed at one side of the press.

The article to be pressed is put into the matrix; the body is filled with a plug made of "supple material or composition possessing " elasticity;" a cushion of similar material to the plug is placed on the brim; a block, "having the same curve and shape as the " top of the matrix," is attached to the bottom of the pressing plate; pressure is exerted by bringing down the plate on the plug and the cushion, and the article is "perfectly dressed."

Sometimes the plug is formed hollow and filled with liquid or gas. If the matrix is too large for the article, it is reduced in size "by one or more hollow blocks."

"For folding the brim up or down," the dressed hat is put on a block upon a table. The brim extends "all round beyond the " flanged edge" of the block; at the side of the block is a grooved roller; the flanged edge and the edge of the brim enter the groove; the roller (or the block) is made to rotate, and "the edge of the " brim of the hat is turned up or down all round."

For shaping the brim, "a shaping instrument" is made of caoutchouc or material similar to the plug; upon it is fixed a crown of *like material*, "having the shape of the oval of the brim;" the two

" have the form of a cover of a box." The box cover is applied under the presser plate of the press. "A metal form, the edges " of which have the shape intended to be given to the brim," receives the hat and is put under the presser plate. Pressure forces the brim and the form to enter the box cover, and its crown, " being elastic, is compelled to open," and "for the same reason " tightens upon the brim and effects the perfect shaping thereof."

[Printed, 8*d.* Drawing.]

A.D. 1863, August 31.—N° 2151.

NEWTON, ALFRED VINCENT.—(*A communication from Charles Fredrick Bosworth.*)—"Improvements in the mode of and " apparatus to be used in sewing by machinery." This invention is applicable to the manufacture of straw hats and bonnets, and to manufactures in which braids are sewn together or to other material.

Four improvements are claimed:—1. A double thread passes into one surface of a layer of braid, out again through the same surface, and through another layer; it is then secured "either by " another thread, as in a shuttle stitch, by a loop of another " thread, as in what is known as the double-looped stitch, or by " a loop of its own thread, as in a crotchet stitch." 2. A roller is combined with the needle and the feeding apparatus in such manner that a turn is produced in the upper layer "to enable the " needle to pass into one surface of it and out again through the " same surface." 3. With the needle and roller is combined "a " contrivance for guiding the needle itself at some points above " the material being served," thus forcing the needle to pierce the braid "at a proper distance from the roller." 4. The needle has given to it "a vibrating movement toward and from" the roller for the purpose of "piercing and carrying the thread through the braid" at various distances from the roller.

The roller is carried by a frame attached to the presser foot bar or to some other convenient part; its axle is at right angles or nearly so "with the progression or feed movement of the goods." An adjustable gauge attached to the frame keeps the upper braid in position laterally, and a bar resting on the surface of the braid makes it "apply itself closely to the roller." This bar is attached to a slide clasping the presser foot bar and adjustable thereon. The lower braid is guided by a guide secured to the table.

The needle is set "so that it will not pierce the upper piece of "braid at all, unless it be bent or spring over toward the roller;" a guide therefore applied to the presser foot bar "springs the "needle over toward the roller when the needle enters the said "guide." The guide is mounted on a spring arm, and an adjustable stop regulates the distance to which it shall approach the roller.

On the presser foot bar there is mounted, so that it can turn freely, "an irregularly polygonal plate" having secured to it a ratchet wheel with a detaining and an actuating pawl; the latter is pivoted to a lever which is pinned by its fulcrum to the presser foot bar. A pin (attached to the needle bar) and the lever are so arranged "that each stroke of the bar shall reciprocate the pawl "and consequently turn the plate." The spring arm bears against the perimeter of the plate and is pressed more or less towards the roller. "By shaping the plate properly" the needle may be caused to pierce the upper layer "at every other stitch, or "at every second, third, or greater number of stitches."

The working of the machine and modifications of certain parts are described in the Specification.

[Printed, 8*d*. Drawing.]

A.D. 1863, October 7.—N° 2456.

ZOX, Raphael.—(*Provisional protection only.*)—"Improvements "in the manufacture of academic caps." The boards or squares are made of layers of gossamer or other flexible fabric cemented together with corners of triangular-shaped vulcanized india-rubber. The rubber is "let in and cemented between the two "exterior layers of gossamer, the interior layers being cut away "to receive the same."

The skull is formed "of tweed and horsehair mixed, or other "soft material or flexible fabric;" it is blocked and stretched in the ordinary manner. The skull "may be stitched entirely "through, or only partly, so as to show or disguise the "stitches."

The caps are covered and lined with the usual materials.

[Printed, 4*d*. No Drawings.]

A.D. 1863, October 21.—N° 2579.

CLARKSON, Thomas Charles.—"Improvements in the "*manufacture* of saddles and harness and in materials for and

" in ornamenting the same, which improvements are applicable " for parts of carriages, dress, and coverings for the head, and " other articles." The second part of this invention relates to the manufacture of " hats, shakos, helmets, head shields, hat " brims, and peaks " without the aid of heat or machinery.

" A stocking-netting or other cover " is pulled over a mould and coated with an india-rubber solution. If a shako is to be made, a small leather tube to hold a ball tuft is stuck on in front. Thin wood or a sheet of cork or of woven wood coated with the solution is caused to adhere to the foundation. Any unevenness is removed from the surface, and a coating of the solution is applied. A covering of calico, cloth, leather, felt, woven willow, or other woven fabric is put on, and the peak is stuck on. The article is then taken off the block, and the portion of the interior which presses against the head is brushed over with " a solution " of glue and isinglass " to prevent " grease passing through." The head leather is then stuck in; it is made in two parts; " that " in front forms a covering for the under side of the peak."

The foregoing method of manufacture is applicable " for " stiffening coats, trousers, leggings, boots, and shoes, ladies' " skirts, and various parts of wearing apparel."

The third parts consists " in giving the aforesaid articles an " ornamental appearance, as if they were sewn." They are pierced " with a toothed or embossed wheel," and the holes are filled " with a cement of a colour as fancy may suggest."

[Printed, 1*s*. Drawings.]

A.D. 1863, October 24.—N° 2627.

HASELTINE, George.—(*A communication from Justus Osman Woods.*)—(*Provisional protection only.*)—" A new attachment to " coverings for the head and to other articles of dress, for lighting " matches." Head coverings and various articles of dress are provided with " a rough or friction surface," against which matches may be ignited for " the lighting of a cigar or pipe."

The friction surface may be fixed to " a tablet or other device " formed of metal, leather, or any other suitable material," and the tablet may be attached to the head-covering or other article by a hook or pin.

Or a thin solution of glue or its equivalent may be applied to any portion of the head-covering, &c. " unaffected by currents of air;"

and sand, emery, or other similar substance may be sprinkled thereon.

[Printed, 4*d*. No Drawings.]

A.D. 1863, October 30.—Nº 2685.

GADD, WILLIAM, the younger.—"Improvements in machinery "or apparatus for the manufacture of bonnet and cap fronts, "which improvements are also applicable to the production of "ornamental effects to other trimmings for wearing apparel." Instead of employing "a different box for every variety to be pro-"duced" of bonnet and cap fronts, the patentee constructs "apparatus to be used in place of or in substitution of such "boxes, applicable to various sizes or breadths of the material "and to different figures or patterns desired to be produced."

A flexible plate is supported and held in position by ribs and buttons or clips; on this plate the lace or other fabric to have form given to it is placed. The ribs are connected to necks on the upper ends of screw stems, whose threads turn in bars on the main framing; the plate can thus be adjusted in height and be "bent, curved, and undulated, as desired to suit variation in the width "of parts of the articles being produced." The plate is formed with pegs, "around or between which the material may "be conducted and held in a great variety of forms." Other pegs may be put into holes prepared for them in the plate, but the patentee prefers to use a separate plate with holes therein to pass over the pegs.

The pinching of the breadths for the application of the band is effected by bars supported on arms, which turn on centres carried by the main framing and are held together during the pinching by spring catches. While the fabric is held by the pinching bars the edge projecting above the bars is damped or has adhesive matter applied to it, and is then acted upon by the surfaces of heated boxes. The boxes slide "in the slotted openings" of frames, which are so arranged that "a parallel motion is capable "of being imparted to the boxes." The boxes "are also capable "of simultaneous motion to or from each other" in their frames.

"Previous to the band being applied a knife is passed on to "the fabric" through an opening at the lower part of one of the boxes "to cut off any superfluous quantity of such material and "render the same uniform."

"The height of the action" of the boxes can be varied by adjusting-screws; and strips of metal may be placed between the pegs "to assist the attendant in giving uniformity of outline to "series of fronts."

The patentee describes the apparatus very fully and "a modifi-"cation of the improvements adapted to the ordinary construction "of boxes."

[Printed, 3s. 8d. Drawings.]

A.D. 1863, November 4.—N° 2734.

LUNEAU, Michel.—(*Provisional protection only.*)—"Improve-"ments in the manufacture of hat or cap frames." This invention, although principally intended "for manufacturing the "frames of caps in general use for infantry," may be applied to "hats or caps of any kind."

The inventor makes a tissue on a loom with a warp of cotton, wool, linen, or silk, and "with a suitable weft." He marks out on the warp "the outside shapes of the required patterns." After throwing the shuttle once or twice he introduces between the threads of the warp "a hair of wild boar;" he then gives "one, two, or three shoots of the weft," and repeats the operation until the tissue is completed. He cuts off each pattern; glues over the edges "a strip of thin stuff;" unites the edges by sewing them over forms to give them the required shape; waterproofs the frames thus made with a layer of gum lac; and covers them with silk, beaver, or other material.

[Printed, 4d. No Drawings.]

A.D. 1863, November 11.—N° 2804.

DURST-WILD, Anne Catherine.—(*A communication from Valentin Chevy jun.*)—"An improved mode of ornamenting hats "and bonnets." This invention relates more especially to "the "class of hats and bonnets belonging to what in general is called "the straw hat trade;" it consists in giving to such articles "a "metallic lustre or gloss."

The hat or bonnet is coated by any suitable method with one or more layers of a solution of glue, isinglass, varnish, or other adhesive matter, and whilst the surface is wet or sticky, gold, silver, bronze, or other metallic powder, is sprinkled over it. Powdered wood, cork, isinglass, stone, mica, &c., may be mixed with the powder. When the hat or bonnet is dry, it may be burnished entirely or partially; or it may be coated with varnish or dyeing liquid; or it may be submitted to the action of any suitable gas or gases.

[Printed, 4*d*. No Drawings.]

A.D. 1863, November 11.—N° 2805.

MELTON, HENRY.—(*Provisional protection only.*)—"Improve-" ments in shakos, military and other hats and caps." The body is formed of "horsehair, crinoline, or of tweed and horse-" hair mixed, or other soft material, or flexible fabric." The body is covered with cloth or other fabric, black or coloured according to the purpose for which the article is required.

The silk or other lining of shakos and some sorts of hats and caps is "to be sewn or stitched to the horsehair or other flexible " body, but not through the exterior covering."

[Printed, 4*d*. No Drawings.]

A.D. 1863, December 11.—N° 3127.

KINSEY, HENRY.—(*Provisional protection only.*)—"Improve-" ments in bonnet front machines, and apparatus connected " therewith." The first improvement consists in "making use of " an additional pair of plates" to protect the bands. Each plate may be hinged "to moveable levers adjusted to any convenient " part of the machine," or be made to slide in grooves or slots. Or the additional plates may be used "in conjunction with a " pair of parallel edged plates" hinged to them, so that the latter " protect the band while the goffering is inserted," when the former "rise up and set the front in the required shape."

The second consists "in simultaneously operating upon both " of the right and left-handed screws which regulate the width " of the trays that carry the profferings." Near one end of each screw is fixed a pinion wheel operated upon by a rack, which is attached to or forms part of a rod lying in bearings at each end of the tray.

[Printed, 4*d*. No Drawings.]

1864.

A.D. 1864, January 4.—N° 17.

EVANS, JOHN CAMPBELL.—(*Provisional protection not allowed.*) —Improvements "in the manufacture of coverings for the head." These articles are made from paper pulp or from pulp composed of shoddy or refuse silk or cotton. Moulds of fine wirework or similar material are covered with pulp; the pulp is dried, and the article "is finished with or without a nap."

In some cases, when a nap is required, the mould is "rotated " during the deposition of the pulp thereon, so that the fibres " will all lie in the same direction."

To render the articles waterproof a "quantity of paper size" is introduced into the pulp.

[Printed, 4*d*. No Drawings.]

A.D. 1864, January 25.—N° 210.

McCALLUM, MALCOLM SINCLAIR.—(*Provisional protection only.*)—" Improvements in hats and other coverings for the head." The body has attached to it inside at the bottom edge " an inter" mediate band of more or less stiffened cloth or canvas folded " to form two plies, the free edge thereof being downwards." The outer edge is secured to the body, and the usual leather band to the inner edge. The space between the leather band and the body may be left open all round, or cement may be applied at one or more points.

To provide for ventilation openings are formed in the upper portion of the intermediate band; or the band may be made of open canvas or other permeable fabric; the ordinary air hole is formed in the crown.

[Printed, 4*d*. No Drawings.]

A.D. 1864, February 5.—N° 309.

BROOMAN, RICHARD ARCHIBALD.—(*A communication from Jean Gaspard Placide Meyer.*)—" Improvements in the manu" facture of bonnets, caps, and hats." These articles are made of " open fabrics or tissues of esparto, wood, and other ligneous " substances," woven fabrics of straw, hair, silk, cotton, whalebone, paper, leather, aluminium, and other materials. In describing the invention esparto is used.

Bonnets:—A sheet of openwork esparto is cut obliquely into strips of equal breadth. The strips are folded "lengthwise in "such manner that each strip forms a double or folded edge and "an open or cut side." The stitching is begun "in the interior, "taking care to turn the open or cut side inside and the double "or folded edge outside." The strips have thus "the appearance "of the finest plaits." Metal threads or wires may be interwoven in the bonnet front, and the above-named substances may be used "alone or combined in different shades."

Hats and caps:—It is necessary to lengthen the strips before stitching them so that they may be sufficiently long to go round the hat or cap "without the appearance of a join."

To impart greater durability to articles made from openwork fabrics of esparto, the fabrics are covered "in a loom, or me-"chanically before weaving them, with silk, cotton, flax, wool, "or other permeable or impermeable textile material."

Other "variations and modifications" may be adopted in the manufacture.

[Printed, 8*d*. Drawing.]

A.D. 1864, February 18.—Nº 422.

HAROLD, JAMES WRIGHT.—(*Provisional protection only.*)—"Improvements in apparatus for stretching or altering hats." This stretcher is made by preference in two halves; each half is hollow to contain hot fluid or other heater, and has an opening into it which is closed by a screw or plug. On each half is a screw nut, and the two halves "are connected by a right and left-hand screw shaft," so that they can be drawn together or moved apart from each other by turning the shaft. The exterior of the apparatus is made to the form of the inside of a hat where it embraces the head and somewhat conical.

[Printed, 4*d*. No Drawings.]

A.D. 1864, March 1.—Nº 506.

HILL, CHARLES GREY.—"Improvements in machinery or appa-"ratus employed in the manufacture of bonnet and cap fronts, "*rouches*, and other millinery trimmings." This invention consists in improvements on those for which Letters Patent were granted to Mr. Hill, bearing date November 22nd, 1859, No. 2645, and July 13th, 1860, No. 1695, and to Messrs. Hill and Jackson, dated July 5th, 1862, No. 1952. "Three several improvements, " arrangements, or combinations of machinery " are claimed.

1. Two rollers with their accessories are described in the last Letters Patent; to these are added "two pairs of goffering " chains " supported on axles in the same standards as the axles of the rollers, " one pair of such chains being placed at each " side of the rollers, and one side of each pair of such chains " being in close proximity to the sides of the rollers next them." Each pair of chains passes "round axles which project inward " from each standard," and the rollers "revolve in the space " between the ends of the projecting axles." Both pairs of chains " are moved simultaneously " and arranged in such wise that each pair " will goffer a lace edging or other fabric supplied to " them and hold it in a goffered form " until the portion which stands out beyond the edges of the chains has been passed between the rollers. The rollers will cause the projecting portion " to adhere to each edge of a lace quilling or other fabric supplied " to and passing between " them. The goffering chains "are " such as make a plain goffer, each goffer being of identical size," or such as are described in the earliest Letters Patent. In either case the two pairs of chains are so arranged that " the several " wires, arms, or links will speedily release the goffers which they " have formed, when the materials which are being pressed and " caused to adhere together have passed over the centre " of the rollers.

2. This relates " to the wires, bars, or rods of any of the " various shapes " mentioned in the earliest Letters Patent. The wires, &c. " have their axles formed on one side of the centre of " the ends " so as to form a chain of such wires, &c. " by means " of straight-stemmed links in lieu of the cranked or crooked- " stemmed links."

3. This refers to the " pressing or making-up machine " described in the second-mentioned Letters Patent. Either the upper or lower bar is moveable. The pressing faces of each bar are " of various widths, either curved or otherwise shaped at the " sides," so that the patentee is enabled " to press one, two, or more variously-shaped fronts or parts of fronts, or rouches, or " other millinery trimmings, together, and make such parts up

" with other parts, whether straight or otherwise shaped, in a " straight-bar press or making-up machine."

[Printed, 3*s*. 4*d*. Drawings.]

A.D. 1864, March 10.—N° 608.

BAZALGETTE, JOHN VAN NORDEN.—(*Provisional protection only.*)—" An improvement in ventilating hats and other like " coverings for the head and in apparatus employed therein." The improvement consists in carrying off the heated air from the head by apertures in the crown, and in supplying the place of the heated air by fresh air introduced through apertures also in the crown. The fresh air is conducted down inside by pipes, or by an inner lining to the hat with passages for the air all round the inside.

The apparatus (a ventilator) " consists of an upper disc with " an aperture through it, and with another aperture opening into " an inclined tube, the lower end of which communicates with an " aperture in a second disc, and this second disc has an inner " lining connected to it." The inner lining is kept at a distance from the crown and sides. The aperture through the upper disc communicates with the space between the crown and body and the lining. The ventilating apparatus is completed by a register plate on the upper disc; this may be made to regulate the apertures in the disc.

[Printed, 4*d*. No Drawings.]

A.D. 1864, March 12.—N° 635. (* *)

FLETCHER, RAYMOND.—" A new compound used for var- " nishing paper-hangings and other articles." The ingredients of this varnish and the proportions preferred are gum sandarac or other gum 1 lb., resin 1 lb., alcohol 1 pint, and methylated spirit 1 pint. The ingredients are placed " by preference in a " cistern made of tin," and the cistern is put into another cistern which is supplied with water. At or near the bottom of the outer cistern is a steam pipe " supplied with steam from a boiler adjacent " thereto." When the solids are dissolved, the varnish is strained through a fine wire gauze.

The patentee mentions a variety of articles to which his varnish *may be* applied; amongst others he mentions hat and bonnet linings, which may be rendered water and grease proof by its use.

[Printed, 4*d.* No Drawings.]

A.D. 1864, March 15.—N° 660.

GEBER, Adolph.—(*Provisional protection only.*)—" Improve-" ments in applying leather to the manufacture of hats, caps, " bonnets, and generally any article of head dress for men, women, " and children." These articles are made " of one entire piece " of leather." A piece of suitable description and dimensions is placed on a perforated mould or plate and rendered soft and pliable by jets of steam beneath the mould. A coat of waterproof solution is then applied " to the back surface " of the piece, and the piece is immediately put upon a wooden block and blocked into shape " by means of hollow pads of felt or moistened rags."

If the article is to have a brim or a peak, the workman after the blocking " ties a string tightly round the form at the place " where the projection is required to be made," and the projection is moulded into shape. If the brim or peak is to be very stiff, a piece of leather or other substance is cemented to it.

The moulded article is then ironed, lined, covered, or ornamented in any suitable manner.

[Printed, 4*d.* No Drawings.]

A.D. 1864, March 26.—N° 756.

CLARK, William.—(*A communication from Louis Simonet.*)—" Improvements in the manufacture of hats and other cover-" ings for the head, in imitation of the various kinds of straw." The patentee uses a " mould of copper obtained by the galvano-" plastic process." He takes an impression of the straw hat in gutta percha, " previously fixing it on a form for the purpose of " preventing the hat from getting out of shape on being placed " in the galvanoplastic bath." He turns the pattern hat inside out in order that " the relief of the straw shall be next the gutta " percha."

He forms the bodies of the hats " of very light open fabrics or " of felt prepared for the purpose."

He coats the fabric forming the body with umg dragon dissolved in water which contains about one-hundredth part of alcohol; to this solution he adds "the colouring substances for "staining the hats." He afterwards applies a layer of varnish composed of collodion and "a certain quantity of white gum lac "and galipot."

The press which he employs consists of two parts, "the upper "one being of cupola form and opening when desired." Pressure is exerted by means of water "producing pressure on a "sheet of india-rubber of conical form entering the galvano-"plastic mould, which is itself placed in a casing of sheet iron "made so as to fit hermetically into the lower part of the press." The mould is heated by the introduction of steam.

[Printed, 4*d*. No Drawings.]

A.D. 1864, April 1.—N° 815.

NEWTON, William Edward.—(*A communication from Almet Reed.*)—"Improvements in looms for weaving hats and other "articles of irregular shape." The loom employed is a circular loom; the patentee gives a very minute description of each part, its arrangement and use, and claims eight "principal features of "novelty" therein.

First claim:—The employment of two distinct sets of weaving mechanism, one suitable "for weaving in a flat or nearly flat "form" as required for the crown and brim, the other "suitable "for weaving in a cylindrical or hollow form," as required for the side; the two are so constructed and arranged "that the "warp may be transferred from one set to the other to change "the form of the weaving." This is effected "by making one "set moveable or adjustable relatively to the other in a direction "parallel with the axis of the loom, so that it may be raised or "lowered or moved in a vertical direction so as to bring the two "sets near to each other," and constitutes the *second* claim.

Third:—The combination of an upper circular clamping plate and "forming shuttle." The plate is as large as the intended circumference of the crown; it is attached by a ball-and-socket joint to a sliding sleeve which is connected to a loaded lever; it serves (along with a lower plate) to hold the crown in place "both while the warps are being transferred from one set of warp "carriers to the other and during the weaving of the side." The *shuttle* is "in the form of a nearly complete circle, whereby it is "made to serve the two purposes of depositing the filling or "weft thread in the shed of the warp in weaving the side of "the crown of the hat, and of gathering in the warp and regu-"lating the size of the crown."

Fourth:—The employment of a "ring or former" in combi-"nation with the upper clamping plate. It is a "removable ring "or band of metal of a circumference just large enough to "receive within it the side of the crown or upright portion of "the hat;" its use is to support the side and "prevent it from "being stretched or pulled out of shape in weaving the brim;" it is preferably of an elliptical shape.

Fifth:—The employment of a series of revolving rings and an attached toothed or notched wheel (or pair of such wheels) "to "separate a series of warp carriers."

Sixth:—This is a claim made for the shuttle described in the third claim.

Seventh:—The employment of "a wheel or rollers so applied "as to press up the filling or weft in the warp by means of "rolling friction when used in combination with a presser "bar."

Eighth:—The giving "the pressing devices" a movement toward and from the centre of the loom during each of their revolutions "for the purpose of producing an elliptical form of "the brim."

The method of working the loom is explained in the description of it given in the Specification.

[Printed, 1*s.* 10*d.* Drawings.]

A.D. 1864, April 23.—N° 1028.

LEWIS, David.—"Improvements in the manufacture of college "caps." The body of the cap is made of three or four thicknesses of calico or other woven fabric joined together with a solution of shell-lac "in alcohol or other hydrocarbon fluid."

Sheets of calico are dipped into a bath of the solution and then stretched on a hatter's frame close together, so that when the gum sets the sheets are united. They are then ironed and cut into sizes. To prevent fraying of the edges thin pieces of calico, india-rubber, or other suitable substance may be gummed or otherwise attached thereon.

[Printed, 4*d.* *No Drawings.*]

A.D. 1864, April 27.—N° 1055.

WHITE, JAMES.—"Improvements in ladies' mourning bonnet "and hat falls." The object of this invention is "to form both "sides of such falls alike," so that whichever side is exposed "the same effect of right or front side will be manifest."

The crape or other fabric to form the fold or folds above the bottom fold is cut into two parts; one part is secured to each side of the fabric forming the body of the fall "by sewing, purl- "ing, or otherwise." Slight pressure applied to the edges of both sides of the fold "will give them the desired appearance "and hide the stitches produced in sewing them on."

[Printed, 8*d*. Drawing.]

A.D. 1864, April 28.—N° 1072.

GHISLIN, THOMAS GOULSTON.—"Improvements in the treat- "ment and application of seaweed." The patentee proposes to call the article produced by his treatment of seaweed "algaeite." He applies his algaeite to the manufacture of a variety of articles; among which are mentioned hats and caps; he also moulds it into soles for boots and shoes.

He first treats "any of the common kinds of seaweed" in the manner described in the specification of Letters Patent obtained by him on July 15th, 1862, No. 2035, and reduces them to either a powder or a paste. He incorporates the powder or paste with the following ingredients or some of them in proportions suited to the article to be made:—Gums, gum resins, resins natural or artificial, bituminous substances, paraffin, oily or fatty substances, fibrous materials, silicates of potash and soda, pulverized chalk, talc, earthy matters, metallic oxides, gelatine, farina, alum, tungstic acid, powdered charcoal, and other analogous substances. He states the particular ingredients and proportions which he prefers, according as he requires tenacity, elasticity, solidity, or durability. For the purpose of incorporating the mass he uses a masticator provided with mixing rollers or other mechanism, and he afterwards passes the mass between cylinders.

The algaeite may be hardened and rendered waterproof by steeping it in boiled oil or in any drying oil, or in a solution of *gum or* resin, or in any kind of varnish.

[Printed, 4d. No Drawings.]

A.D. 1864, April 29.—N° 1075.

ALDRIDGE, Frederick Thomas, and JACKSON, Maxwell Julius.—"Making hats perfectly grease-proof." The hat body is composed of two thicknesses of calico and one of paper covered with "the composition known as oleo-charta patented by Francis "Robert Piltz, May 28th, 1863, No. 1335." The materials are all steeped in "a solution of shellac, liquid ammonia, and water, "and are then caused to adhere together by the application of "heat."

The brim undergoes the same process as the body, except that a layer of varnish (made of shellac dissolved in spirits of wine) is applied between the paper and the calico. The brim is joined to the body "by means of great heat."

[Printed, 4*d*. No Drawings.]

A.D. 1864, June 7.—N° 1419.

LARMUTH, Alfred Augustus.—"Improvements in hats, "caps, bonnets, or other such coverings for the head, which im"provements are also applicable to corsets or stays, and saddlery "or harness." The hat is of the ordinary shape, but the leather lining is partially or wholly goffered into plaits or corrugations "constituting tubes through which air may pass when the hat is "placed on the head." The lining is sewed on as in ordinary linings. It is advantageous to leave the front portion of the lining plain, so as "to avoid the chance of indentations being "made on the forehead."

The invention may be adapted to stays and to such parts of saddles or harness as press against the body of the animal.

[Printed, 6*d*. Drawing.]

A.D. 1864, June 16.—N° 1503.

JAY, William Chickall.—"Improvements in the manufac"ture and ornamentation of ladies' wearing apparel." The object of this invention is "to present different patterns or devices "upon one and the same article, the colours being also varied." The articles named are the skirts and bodies of dresses, mantles, cloaks, and bonnets. "Portions of ornamented fabrics" are attached to the articles; the central parts are secured to the material of which the article is made; the sides or ends are "left "loose but capable of being turned or folded over to enclose one "pattern and expose another," or of being opened and exposing a different pattern. When the ornamented parts are opened out, the corners are secured "by ornamental buttons or by hooks and "eyes or other fastenings suitable for the purpose."

The loose portions form "flaps, wings, or lappets, "either side "of which may be of different patterns" and ornamented as desired. The skirts of dresses may be "tucked with spaces at "intervals on the top," and ornamental openings may be cut in the material "in order to drop into each recess a different "colour."

[Printed, 10*d*. Drawing.]

A.D. 1864, June 23.—N° 1572. (* *)

SMITH, James.—"Improvements in the manufacture of ventilating hats or coverings for the head." The brims and bands or bodies (exclusive of the crowns) are made "with one or more "thicknesses of jaconet, calico, swan's down, cork, felt, or willow, "treated as usual with spirit varnish, shellac, and other gums "and varnishes." But instead of making the crown as usual, a fabric is used having a "warp of linen, of cotton, of silk, of "worsted or of other fibre," "the weft of which is composed "of horsehair." When the hat is made up, the brim and band or body is covered with hatter's silk, merino, or lustre, but the crown should be left "uncovered for the purpose of ventilation." If desired, the same fabric as that of which the crown is made could be introduced into the band or body.

[Printed, 4*d*. No Drawings.]

A.D. 1864, July 29.—N° 1886.

FREYSTADT, Hermann.—(*Provisional protection only.*)—"Improvements in the manufacture of hats, caps, bonnets, and "other coverings for the head." The inventor produces "a "cheap and suitable material" for the bodies, brims, and trimmings of these articles by the use of paper, millboard, cardboard, pasteboard, or "Brazilian leaf." He covers the material with calico, linen, silk, or other suitable fabric, and then applies a coating of japan.

[Printed, 4*d*. No Drawings.]

A.D. 1864, August 2.—N° 1922.

BARBER, William.—(*Provisional protection only.*)—"Im-"provements in stiffening or proofing felt or other hats." The inventor frees the outer surface of hats from the stiffening or proofing, and prevents "its appearance as stains thereon," by coating the outer surface "with a resisting preparation of flour or "other paste or similar material." The paste, "soaking in a "short distance, stops the penetration of the stiffening or proof-"ing," and is afterwards washed off.

[Printed, 4*d*. No Drawings.]

A.D. 1864, August 15.—N° 2032. (* *)

COLLINS, Sidney, and **COLLINS,** Charles.—"An im-"proved method of producing silk floss adapted for being woven "and spun into articles of use."

The patentees say:—"This invention consists in converting "silk rags, cuttings of silk, and other silk refuse or waste "into silk floss adapted for being spun and woven, and for all "other purposes for which silk floss or raw silk is or may be "used."

"The following is an example of the means by which silk floss "may be produced according to this invention:—We com-"mence by separating the silk rags, waste, or refuse, according to "their color, keeping each color distinct and separate, or if "desirable we work them mixed together; we then proceed to "place them in a brake for the purpose of shredding or tearing "them asunder; we then operate upon them with a carding engine, "and afterwards bleach them by any convenient and suitable "means, or dye the silk thus operated upon of any desired color. "By this means we utilise waste silk, which at present is nearly "useless, being principally used as a manure, and convert same "into a commercially valuable article capable of being made into "silk twist, silk for hats, dresses, and various other useful pur-"poses at a greatly reduced price; or the silk thus produced may "be mixed with jute, cotton, wool, raw silk, and various other "fibrous substances." This silk may be used for hats.

[Printed, 10*d*. Drawing.]

A.D. 1864, August 29.—N° 2124. (* *)

BROOMAN, Richard Archibald.—(*A communication from Jean Gaspard Placide Meyer.*)—(Provisional protection only.)—

“ A new thread, and the manufacture therefrom of fabrics and “ ornaments, particularly applicable to bonnets, caps, and hats.”

This invention “consists in manufacturing a new thread from “ esparto or other vegetable or woody fibre, and in making with “ this new thread fabrics, plaits, and ornaments for bonnets and “ other purposes.”

To form the new thread thin strips or “cores” of wood or vegetable or woody fibre are covered with a thread of cotton, silk, or other suitable material “of any desired shade,” such thread being then applied in the manufacture of bonnets, caps, and hats. To “vary the appearance” of these articles the fabric employed may be formed of a warp of the esparto thread, and a weft of any other textile material. Plaits may also be manufactured from these esparto threads, “the design or effect of which may be varied “ as desired by mixing different colored threads;” and ribbons and ornaments for bonnets and hats may be also made of this material, “ the threads being all of the same color or of different colors, or “ mixed with threads of other material according to the effect to “ be produced.”

[Printed, 4*d*. No Drawings.]

A.D. 1864, September 28.—Nº 2378.

DAVIES, George.—(*A communication from Henry Louis Charlemagne Lhuillier.*)—“The employment and application of “ thin strips or sheets of wood for various new and useful pur- “ poses.” The applications mentioned are many; those which relate to the present series are,—

To boots and shoes:—Strips (one or more) are cemented, sewn, or otherwise introduced between the leather soles “to resist damp “ and also to obtain with economy the thickness desired.” Loose soles are made of strips or sheets of wood as a substitute for cork soles.

To crinolines, bustles, stays, &c.:—Strips of wood are substituted for those of iron, steel, or whalebone.

To coverings for the head:—Sheets of thin wood cemented or otherwise joined together are used for the bodies or foundations of hats, shakos, &c.

[Printed, 4*d*. No Drawings.]

A.D. 1864, October 18.—Nº 2576.

JOHNSON, James.—(*Provisional protection only.*)—“ An im- “ *proved* composition for finishing or renovating silk, satin, stuff,

" woollen cloth, silk, beaver, or felt hats, cotton and other fabrics." The composition consists of the following ingredients powdered and mixed together in the following proportions :—" Benzoin, " one pound; carbon, half a pound; mastiche, thus, sambul and " styrac, of each two ounces; and black oxide of manganese one " ounce."

The composition, rubbed or brushed on the above-named articles, gives them "an excellent finish and renovating appear- " ance."

[Printed, 4*d*. No Drawings.]

A.D. 1864, November 3.—N° 2720. (* *)

HUGHES, Edward Thomas.—(*A communication from Emilien Kuister and Marie Margaron.*)—" Improvements in the manufac- " ture of hats, caps, bonnets, or other coverings for the head."

The invention " consists in various improvements in the manu- " facture of tissue crape and tulle crape composed of silk, cotton, " wool, goats' hair, and other textile materials, singly or com- " bined, and plain or figured, which crapes are to be formed of " all shades and colors, and can be applied to head dresses and " other articles of wearing apparel and other similar purposes."

Firstly, " the cotton crape is made in taffetas of various " strengths, thicknesses, or foundations, and figured, or in the " English style, but formed with cotton warp, and weft twisted " to a much greater torsion than the silk employed for ordinary " crape, the said twists or turns being about ten thousand to the " metre."

Secondly, " the silk crape is formed with one or several founda- " tion warps, and differs from the ordinary crape, for instead of " being produced in taffetas, it is obtained upon a tissue founda- " tion similar to satin, serge, and other woven fabrics, with or " without a wrong side. This kind of crape is made of prepared " silk formed into threads of one, two, three, or more ends, hav- " ing from 2,500 to 3,500 twists to the metre, and with different " degrees of torsion; it may be varied as desired by mixtures " of threads of cotton, wool, goats' hair, flax, and other textile " materials, and figured or ornamented according to fancy."

Thirdly, " the English crape is formed in any of the English " styles obtained by means of the different kinds of looms, with " a full foundation of one or of several warps, and faced with " milled silk twisted to about 3,600 twists to the metre."

Fourthly, "the tulle crape is made in any of the different looms "for weaving tulle, and in all the sizes of web or mesh employed "in the manufacture of tulle and lace in general."

"These four fabrics are formed with one or several warps, and "the English crape and tulle crape are craped by craping machines, and by all the means employed at present for tissue "crapes in general."

Fifthly, "with the above-named four kinds of crape, and by "means of a suitable application, a fifth kind of crape, called "sparkling crape, is made. This is effected by sprinkling on the "fabrics when being dressed or finished a sparkling powder of "various materials and colours, which adheres to the stuff in "drying."

[Printed, 4*d*. No Drawings.]

A.D. 1864, November 9.—N° 2778.

WELCH, JOHN DAVIS, and WELCH, ALFRED PHIPPEN.—"An improved mode of strengthening and giving a flexible "finish to the brims of straw hats." The brims have secured to them "cane stripping or whalebone or other similar light and "elastic material." The patentees prefer cane.

The cane is stitched round the hat as near to the edge of the brim as convenient and is covered "with a binding of hatters' "galloon or of straw plait or other binding." Or the cane may be secured between double rows of plait or in a groove pressed in the brim. The cane and the gooove may be on either side of the brim.

[Printed, 4*d*. No Drawings.]

A.D. 1864, November 10.—N° 2790.

COOLEY, ROBERT BARLOW.—"Improvements in the manufacture of hats, caps, and bonnets, or other coverings for the "head, and in apparatus employed in such manufacture." These articles are covered with "tubular or seamless elastic "knitted or looped fabrics," made upon circular knitting machines with additional threads of india-rubber introduced into the fabric. Mr Cooley obtained Letters Patent for such fabrics dated February 17th, 1857, No. 468. Woven or other fabrics may be combined with tubular elastic fabrics "by cementing "the same thereon with india-rubber or other cement."

The covers are stretched over the bodies; they are sometimes made long enough to pass into the inside and form covers and linings without seam or joint. The top end of the cover is drawn to the centre of the crown and is secured "by a ventilating cen-"tral ring or otherwise."

The covers may have "an ornamental or fancy character "imparted thereto." A part may be dyed "to produce the "appearance of a mourning band." They may be composed of "different colored threads."

For hot climates the body of the article is made of "perforated "or openwork materials."

The apparatus employed in manufacturing these articles consists of a suitable shape or block "surrounded by an open frame "or covering die." The elastic fabric for the cover is stretched between them, and held in position until set by points, set-screws, "or other suitable mechanical contrivances;" the edges are afterwards secured, and the article is "ornamented or finished "according to the taste of the wearer."

[Printed, 4*d*. No Drawings.]

A.D. 1864, November 15.—N° 2851.

VERO, CHARLES.—"Improvements in the manufacture of "hats." This invention is an improvement on the one for which Letters Patent were granted to Messrs. Vero and Everitt, dated June 15th, 1857, No. 1668. The patentee now produces "a body "of fur by throwing the fur loosely by means of a rapidly re-"volving brush or otherwise against a hollow cone or form of "perforated metal, within which a partial vacuum is maintained "by means of a fan or otherwise." With this body of fur he combines "a woollen body obtained by the winding of a sliver on "to a cone or form." For the former process he uses the apparatus patented by W. E. Newton on January 29th, 1850, No. 12,955, and for the latter the one patented by W. Wilson, on January 23rd, 1861, No. 185.

He removes the wool from the cone and places it on the cone over the fur. "The deposition of fur is again commenced." The body is then "ready to be consolidated" by steaming it and pressing it between "forms fitting together," the perforated cone serving as the lower form. The upper form is "a similar per-"forated cone but fitted with handles one at each side of its base." The steaming and pressing are performed on a table through which a jet passes, so that steam can be blown into the interior of the inner cone. "The workman gives to the upper die " or form a very short rotatory motion first in one direction then " in the other; this he does whilst still maintaining the pressure." When the upper form is lifted off, "it will be found to take the " hat body with it;" the two are placed over another form heated by steam but not perforated. The pressing, &c. processes are continued until the body becomes dry, when the upper form may be lifted off, leaving the body behind.

The planking process is performed in a machine patented by W. Wilson on January 13th, 1859, No. 117; but the patentee uses the cloth therein mentioned "only for the first few passages " through the machine;" during the rest of the operation he uses "a string which is rolled up in the bundle." A very open network fabric may be used in the latter part of the planking process.

"From this point the hats are finished by the ordinary and " well-known processes."

The patentee claims in making hat bodies the use of perforated cones "capable of being connected together at their bases for the " winding operation and disconnected for the fur-blowing opera- " tion." He claims also "the feeding fur on to the doffing " roller of the carding engine, which is producing a sliver of " wool, and the winding the compound sliver thus obtained on " to cones."

[Printed, 8*d*. Drawing.]

A.D. 1864, November 18.—N° 2887.

WILSON, William.—"Improvements in the manufacture of " hats." This invention consists in improvements on the one for which the patentee obtained Letters Patent bearing date January 23rd, 1861, No. 185.

First improvement:—Forming a hat body of wool or wool and other substances in such a manner that "the outer part may " consist of finer material than the other." Two pairs of feed rollers at a suitable distance apart are attached to the carding machine; they are "driven by a shaft from the doffer and con- " nected by a lever with another shaft attached to the ratchet wheel " of the hat-forming machine" as described in the Specification of the above-mentioned letters patent. By means of "certain levers "and suitable gearing," one pair of rollers can be stopped and the other pair be put in motion when required. When sufficient coarser wool has passed from spools through the lower pair of rollers on to the cones, and sufficient finer wool through the upper pair, a bell gives a signal "to cut off and remove the hat "bodies from the cones."

Second improvement:—"The machine for hardening hat "bodies." The arrangements for steaming the body described in the before-mentioned Specification are dispensed with, and a fixed perforated cone through which steam is admitted is substituted. The body is penetrated by the steam, "whilst the jiggering "motion is given to it by suitable gearing, and it is pressed on "alternately all round by the outer cone." The machine may be made double.

Third improvement:—Shaping the brims by means of pressure. The upper plate of "a water press, such as is used by hat manu-"facturers," can be raised and lowered, and is "furnished with "a circular india-rubber bag, in the centre of which is fixed a "a brow block." Below is a plate with a hole in the middle for the crown to pass through. Moulds made in one or more parts of the shape required for the brim and capable of being heated are placed on the under plate. The brim is placed on the mould; the upper plate is lowered; the brow block fits into the hat; the bag is brought down at the same time; water is let into the bag; and the brim receives its shape from its pressure on to the mould.

Each improvement is described at length in the Specification.

[Printed, 1*s*. 10*d*. Drawings.]

A.D. 1864, November 24.—N° 2944.

CLARK, WILLIAM.—(*A communication from Adolphe Pierre Viol and Césaire Pierre Duflot, junior.*)—(*Provisional protection only.*)—"Improvements in the metallic ornamentation of feathers, "plumes and other like articles." The inventors "impregnate "or as it were incrust all parts of the fibre" with metal by the aid of galvano-plasty. When the metallization is obtained, the article may be varnished, glossed, mounted, and burnished, or be allowed to remain dead.

[Printed, 4d. No Drawings.]

A.D. 1864, November 29.—N° 2971.

GORDON, Alice Isabel Lucan.—"Improvements in hats." This invention relates to "hunting hats, policemen's hats, and "hats of all kinds which are worn in cases of danger" or where the wearer is liable to be injured on the head.

The hat is made "of a flexible material impervious to air and "moisture." In the upper part is a false crown, "forming an "air-tight chamber" and a cushion to protect the head in case of a blow, &c. The chamber may "lie flat on the top of the hat "resting on the false crown" or be divided into compartments and distributed over such parts of the head as may be thought to require protection. Round the part which fits the head is another air-chamber applied to the exterior of the hat "in the form of a "fillet." The chambers are provided, if required, with a mouthpiece and valve for inflating and exhausting them. "Any ordi-"nary means of ventilating the interior" of the hat, such as holes round the hat below the false crown, may be adopted.

[Printed, 8*d*. Drawing.]

A.D. 1864, December 14.—N° 3099.

BELDING, George Washington, and HOLMAN, David Emory.—(*A communication from John Rogers.*)—"Improvements "in machinery designed for shaping and pressing straw hats, "bonnets, and other articles." The machine is made of metal; the blocks of wood or of metal; in either case they have a covering of india-rubber or other yielding material. The machine is composed of (1) a horizontal frame; its supports are bolted to a block which slides on the bed-plate; (2) a shaft passing through journals at each end of the frame and carrying the pressing and shaping block at one end; (3) two levers connected to the frame and the shaft so as to form "toggle joints;" (4) a hand or power wheel, or a crank arranged to bring the levers into line, "there-"by exerting the required pressure" on the block; (5) a steam chest or heating box open at one end; this end is closed by a mould so secured to the chest that it may be readily removed; (6) connecting pins and keys on a "key-band" which is moved by a handle, "simultaneously locking or unlocking both pins;" the pins are adjustable "for the purpose of adapting the machine "for pressing and shaping articles of various thicknesses without "a change of parts."

The block used may be either expanding or non-expanding. The expanding block is made in four sections; these are forced outwards at the time that the block is pressed into the mould by means of levers hinged at one end to a boss and at the other to "metal conical sections" inside the block. Inside is "a spiral "spring for contracting the block."

The mode of connecting the various parts and the working of the machinery are described in the Specification.

[Printed, 10*d.* Drawing.]

A.D. 1864, December 15.—N° 3110.

HANCOCK, Charles, and SILVER, Stephen William.—"A new manufacture of certain flexible elastic waterproof sheets, "surfaces, compounds, and substances, and the application there-"of to various purposes," among which are enumerated hat, cap, and other bodies, and shoe soles.

These articles are made from either "an admixture of the milk "of caoutchouc and the milk of ballata" in equal proportions generally, or a fabric coated with the mixture. If "pigments, "powders, sulphur, or colouring matter" are to be combined with the mixture, they are to be ground or mixed in water or in flour, paste, size, or gum, and to be stirred into it.

The process of making a sheet from the mixture is as follows:—On a perfectly flat tablet of plaster or clay float or otherwise distribute an even surface of the compound milk; when this is dry, float on another, and so on until a sheet of the requisite thickness is obtained. Or float on one milk only, and when that is dry float on the other; continue alternate coats of the milks. When thoroughly dry raise the sheet at the edge, draw it carefully off, and suspend it in the air to be further dried for use.

Blocks are made by repeating the layers of the mixture, or by rolling sheets into a solid and employing pressure.

Each sheet requires to be brushed over with a mixture of glycerine and water or with pumice powder before a second coating is applied, the surface "being greasy" when dry.

Compound fabrics are made by coating fabrics with the mixture or by causing sheets to adhere to them "by means of hot plates, "rollers, or other convenient and suitable methods;" if they are to be vulcanized, sulphur must be mixed with the compound milk. Other modes of manufacture are described in the Specification.

[Printed, 4*d*. No Drawings.]

A.D. 1864, December 17.—Nº 3129.

COOKE, Frederick.—(*Provisional protection only.*)—"Im-"provements in machinery or apparatus to be employed in the "manufacture of hats or similar coverings for the head." The first part this invention "is designed to produce a sharp, angular, "and well defined edge at the junction of the crown with the "sides." An india-rubber or other elastic crown core, "formed "with an angle corresponding to the mould in which the hat is made," is fitted into the crown whilst the hat body is in a pliable state. Pressure is applied, and the core, expanding and pressing the felt or other material into the angle of the mould, produces "an angular junction between the sides of the crown."

The second part relates to "a novel method of releasing and "lifting the hat body from the mould." An "hydraulic piston "and cylinder, actuated by the pressure of water used to press "the hat," are employed. "By admitting the pressure of water "beneath the piston it becomes lifted, and through the medium "of a piston rod the hat is released or lifted from the mould."

[Printed, 4*d*. No Drawings.]

A.D. 1864, December 21.—Nº 3168.

HILL, Charles Grey.—"Improvements in machinery or appa-"ratus employed in the manufacture of bonnet and cap fronts, "rouches, and millinery, or other trimmings, and in the manu-"facture and production of the same." The patentee claims three improvements :—

1. He employs goffering chains "having the wire plates or other "pattern-forming portions thereof set in a vertical position "pointed towards a drum" which receives the goffered materials upon the edges of a lace, quilling, or other fabric passing over the periphery of the drum. The goffered material and the lace, &c. are then passed under two or more pressing wheels which run upon the periphery of the drum. By this means the material "*having* received a form" is caused to adhere to the edges of the

lace. One (or more) of the pressing wheels is placed "under the " goffering chains and above the drum." Or a portion of the wires is cut away "so that a thread may lie by the side of them without being goffered." This thread "will hold down and lead " away such material to the pressing wheels." The chains, pressing wheels, and drum, "can be geared together to move at " the same speed."

2. He employs goffering chains in pairs; they are placed "upon " axles projecting from the sides of standards which move upon " or in grooves, so that the chains may be drawn away while the " materials are pressed by a making-up machine, which has one " of its pressing bars above" and the other below the material. Guides pass "through the sides of the chains;" they hold the goffered materials when the chains "have been drawn out or " drawn nearly out" so as to enable the making-up machine to press the materials together. The links of the chains "may be " of divers lengths." He employs other guides "with loose " ends;" these are inserted "at either end of the goffering chains " on each side of the material after it is goffered;" they hold the material in position "until pressed either by pressing bars forming part of the machine, or in a separate pressing machine." Sometimes he employs guides formed of rods "having needles " inserted in them;" these "pass in the goffered material" and hold it until pressed.

3. He employs "a pair of open-ended heated pressing rollers " grooved upon their circumference." Near "each pair of " grooves" he applies a guide "which will fold a binding or " other material" so as to enclose in the fold a wire (which is " enclosed by such grooves") at the same time "as the pressed " edge of a bonnet front, rouch, or millinery or other trimming " which is passed into the fold of the binding or other material." The whole is pressed by the heated pressing rollers "to form a " band."

The various parts of the machines are explained at length in the Specification and in six sheets of drawings.

[Printed, 3s. 6d. Drawings.]

1865.

A.D. 1865, January 18.—N° 146.

CAHUZAC, François Paul Henri.—(*A communication from André Lyon.*)—" Improvements in apparatus for ironing and dres-" sing woollen and other tissues." The apparatus consists of three tables; they are hollow, made of two sheets of metal; the bottoms are flat, " and the tops in the case of two slightly con-" vex;" all are covered with cloth or canvas and heated by steam.

For ironing and dressing coats, cloaks, and similar articles, velvets or " high-napped stuffs," the top is perforated with holes for the passage of steam or hot air.

For felt hats, bonnets, and the like, moulds are used; they are made of two pieces of metal fitting closely one on the other and turning on a pivot. They are heated by steam; the outer one is perforated with holes and covered with cloth or canvas.

Steam or hot air is supplied to the tables and to the moulds from above; they can therefore " be fixed to the wall and sup-" ported by one or more legs or brackets."

[Printed, 8*d*. Drawing.]

A.D. 1865, January 28.—N° 258.

HIGGINS, William Hiram.—(*Provisional protection only.*)—" Improved machinery for shaping hat and bonnet blocks." This invention is an adaptation of the machinery for manufacturing lasts (patented by Thomas Edward Irons on June 29th 1853, No. 1564) to the purpose of shaping hat and bonnet blocks.

1. The fulcrum of the cradle or rocking bed is now placed " near to the bottom of the framing of the machine."

2. The cutter holder is constructed " with grooves or recesses " and slots in the face," so that the cutters can be adjusted and readily removed. The cutters are formed of bands of steel bent to the desired form and afterwards tempered.

3. " As regards the chucking of the blocks to be shaped " the cutters and governor " work from the centre of the machine, id " est, from each other, instead of one following the other."

4. Toothed wheels are used " for communicating motion to the " cradle shaft from the main driving shaft, for imparting motion

" to a right and left-handed traveller screw, for moving the " governor and cutter carriages backwards and forwards." A hand lever in combination with the wheelwork reverses the direction of motion of the traveller when required.

5. "The headstock or saddle of the governor" is formed double " so as to carry two governors placed in a line one behind " the other, each mounted upon a separate axis." By this arrangement "knives of different shapes" can be used, the periphery of one governor being round, the other V-shaped. It is proposed "to adapt a screw to the carriage of the sole plate of " the governors to operate in a similar manner as the slide-rest " of a turning lathe."

[Printed, 4*d*. No Drawings.]

A.D. 1865, February 18.—N° 463.

CARCHON, Emile.—(*Provisional protection only.*)—" Improvements in dyeing the herbs and straw used in the manufacture " of straw hats, and artificial flowers or other fancy articles." The dye produced is a rich and bright green dye.

The process is as follows:—The straw, &c. is cleansed by steeping it for a short time in boiling water. It is then rinsed in cold water and bleached in a bath composed of 40 pints of water holding in solution "300 grains of chloride of calcium and " from 110 to 140 grains of sulphuric acid." It is again rinsed in cold water, and afterwards is put into a bath "containing one " of the following mordants, namely sumac, litmus, alum, tartaric acid, tartrate of potassa, or any chemical possessing the " same properties." Finally it is put into a bath containing the dye, which is composed of "a quantity of the liquid from the last " named bath," a small quantity of either "picric acid, curcuma, " or any other matter having a deep yellow color," and green aniline.

[Printed, 4*d*. No Drawings.]

A.D. 1865, February 22.—N° 498.

CARTER, John.—" Improvements in apparatus for ventilating " hats." For this purpose a tube is used, formed with a moveable or fixed flange at one end for attaching it to the crown. This tube is divided into two channels by a partition fixed longitudinally therein. The lower end of the tube is closed, whilst the upper end is open, and there is an opening on each side of the tube near its opposite ends.

In place of the tube having a longitudinal partition, two tubes may be used, one within the other, leaving a space between them. In this arrangement the outer tube has similar means for fastening it to the interior of a hat as above-mentioned. "Or two tubes " may be placed side by side."

The air from the outside is distributed within the hat by means of a rose.

[Printed, 6*d*. Drawing.]

A.D. 1865, April 3.—N° 941. (* *)

VERO, Charles.—(*Provisional protection only.*)—"Improve- " ments in the manufacture of felt hats." The under side of the brim is dyed of a black or other dark colour, whilst the upper side and the body retain their ordinary colour.

"A hot solution of bichromate of potash" is applied to the under side of the brim; the surface is then washed with cold water, and "a hot decoction of logwood, or madder, or fustic, or " a combination of these materials is then applied." This process produces a brown colour; if a black be desired, "a second " coating of the bichromate of potash is applied, and a second " coating of the decoction of logwood, and afterwards a solution " of a salt of iron."

[Printed, 4*d*. No Drawings.]

A.D. 1865, April 5.—N° 961.

STANLEY, Robert.—(*Provisional protection only.*)—"An im- " proved hat ventilator." It consists of a metallic cylindrical framework, open at one end, and having an exterior flange surrounding this open end. The other end of the framework is closed, and provided with openings adjustable by means of a revolving disc, with corresponding openings, and working on a central pin fixed in the centre of the closed end. The framework may be stamped out of sheet metal, and furnished with arms projecting from the flange. These arms serve as a fastener by being bent down in the interior of the hat. A washer may be *inserted* between the interior and the arms.

[*Printed, 4d*, No Drawings.]

A.D. 1865, May 1.—N° 1218. (* *)

NEWTON, William Edward.—(*A communication from the American Waterproof Cloth Company.*)—" Improvements in the " manufacture of flock fabrics." This invention aims at overcoming difficulties which have been experienced in dyeing or printing " waterproof cloths with woollen, silk, or fur surfaces."

The cloth is submitted to a steam heat of from 220° to 290° Fahrenheit for 20 or 30 minutes. " This process has the effect " of evolving all the chemical action produced by the ingre-" dients used in the rubber, gutta-percha, or other mixtures of " which the cloth is composed; after this the cloth is submitted " to a bath of muriate of tin at from four degrees to twelve " degrees of strength." After removing the goods from this bath, " they are submitted to a bath of aqua ammonia and sal soda " of a strength sufficient to neutralize the muriatic acid or any " impurities or other chemical negatives which may be upon the " face of the cloth; this latter application may be used either " before or after the bath of muriate of tin." The goods are then " submitted to a solution of sulphuric acid and chloride of lime " in order to thoroughly oxydize the previous deposit of tin, " and afterwards to a solution of sulphuric acid and water to " remove the lime." A mordant is thus formed for any color in dyeing or printing, and the desired colour may be obtained " at a " lower temperature of heat or steam, and of a more uniform and " beautiful shade than by any process heretofore known."

By this invention cloths " impervious to water, dampness, or " dust," can be produced suitable for piano, table, and other furniture covers, robe linings, travelling bags, shoes and shoe linings, saddle cloths, hats, caps, carpets, clothing, " and a vast " number of other uses to which woollen, silk, or other expen-" sive goods have hitherto been applied."

[Printed, 4*d*. No Drawings.]

A.D. 1865, May 12.—N° 1314.

GIRARD, Etienne Lucien.—(*A communication from Onezippe Silvie.*)- "Improved machinery for fulling fur hats or felt hats." The machinery comprises a fulling machine and a "pressing " machine which completes the operation of fulling."

The fulling machine is composed of (1) a fulling tub, opening at the top and holding the acidulated water and hat bodies; (2) two fulling rods " working alternately " within the tub; (3) a crank shaft "so arranged as to give an alternate up and down "movement to the fulling rods;" (4) upper and lower guide rods "to maintain the position of the fulling rods;" (5) a fly wheel and fast and loose pulleys; (6) a pipe to convey the acidulated liquid from the pressing machine into the fulling tub. The fulling rods are furnished with rounded wooden teeth placed in rows one above the other on opposite sides, one set "for the purpose "of subjecting the hats more immediately to the fulling action," from which the other set "prevent escape." One side of the tub can be withdrawn for the removal and introduction of the hat bodies.

The pressing machine consists of (1) two rollers, the lower of which is covered with a felt band and is about half immersed in acidulated liquid; (2) a wooden receiver holding the liquid which is "maintained at boiling point;" (3) levers and a weight which act upon the upper roller; (4) a wooden table placed in front of the rollers on the frame of the machine; (5) "cast-iron slide "blocks, having brass bearings" for the axles of the rollers and supported on the framework; (6) a pipe for conveying the liquid into the fulling tub. There may be several pairs of rollers, each pair independent of the others and having a separate receiver.

[Printed, 1*s*. Drawings.]

A.D. 1865, May 25.—N° 1442.

EUSTACE, Jeffery.—(*Provisional protection only.*)—"An im-"proved composition to be employed in the manufacture of bon-"nets and hats." This composition for coating or enameling bonnets and hats is to be used "in lieu of dyes."

The composition consists of the ordinary gelatine solution or size, powdered bismuth or preparations thereof, and silver bronze. The proportions are about 2 quarts of gelatine, 1 ounce of bismuth, and 1½ ounces of bronze. The mixture is reduced to the consistency of thin cream; the bonnet or hat is coated with it, and when dried and blocked presents "a silvery like effect or "metallic appearance." Other bronzes or colouring matters may be used instead of silver bronze.

[Printed, 4*d*. No Drawings.]

A.D. 1865, June 26.—N° 1707.

***NEWTON*, William Edward.**—(A communication from *Edwin Dodd McCracken*, *James* McCracken, Charles Edward McCracken, *John Adams Southmayd, and Robert Warner Southmayd.)*—" Im-" provements in the manufacture of hats and other felted goods " and fabrics." The inventors combine some low-priced vegetable fibre with wool or fur " so as to produce a perfect felt with great " economy." The fibres of the various reeds and canes " classi-" fied by botanists as arundo and bambusa " are applicable to such purpose.

The cane or reed is cut into pieces of convenient length and " disintegrated either by the use of steam or by subjecting it to " the action of alkalies or acids." The pieces are bleached and " further disintegrated by boiling in a solution of caustic alkali." They are then washed in clean water, dried, and subjected to the action of pickers, cards, or other suitable machinery.

The mixture of the fibre with wool may be effected " in a picker " or carding machine," and the manufacture into felt is the same as that of wool felt.

From 33 to 50 per cent. by weight of cane or reed fibre may be mixed with wool or fur " without apparently impairing the quality " of the felt."

The strength of the solution of caustic alkali varies from 3° to 20° Beaumé, " according to the color to which the fibre is to " be bleached."

[Printed, *4d.* No Drawings.]

A.D. 1865, July 29.—N° 1966. (* *)

WORSNOP, Reuben.—(*Provisional protection only.*)—" An " improvement in 'cap frames.' " The inventor introduces " a " ring of wrought malleable cast or brass metal or other suitable " substance upon the periphery of the cap, so as to form a pro-" jection, by preference about the centre of the length of the " same." This ring, if of wrought iron, " may be shrunk on and " then turned to a small round edge, or it may form part of the " cap itself, or be affixed in any convenient manner." The result of it is " that on starting a frame the thread instead of resting, as " is now the case, upon nearly the whole length of the cap, and " breaking in consequence of the friction it is subjected to, rests " upon the lower end of the cap for a short distance, and upon " the edge of the ring before named, and thus in a great measure " prevents breakages and saves yarn."

[Printed, *4d.* No Drawings.]

A.D. 1865, July 31.—N° 1971.

STETSON, THOMAS DREW.—(*A communication from Elias Rosenwig.*)—" New and useful improvements in the construction " of hats." The chief improvement relates to the construction of the brim. The body and the brim are made of an upper and a lower layer of cloth, felt, or other ordinary substance, and of an intermediate thickness of coarse felt or the like; the intermediate thickness however may be omitted. The layers are cemented together with thin layers of gutta percha tissue by the application of a heated iron.

A flat wire of tempered steel encircles the brim; it is secured thereto by an inner binding of tape and an outer binding of silk ribbon which conceals the wire and the inner binding. The wire is "placed edge upward so as to bend easily in the horizontal " plane but maintain a great stiffness vertically." To give the proper curve to the brim the wire is forced within the inner binding "so as to cause it to contain a greater length of wire" than the "ordinary periphery of the brim." The ends of the wire are secured in a clasp.

The wire and the method of fixing it are applicable to any ordinary form of hat.

[Printed, 6*d*. Drawing.]

A.D. 1865, July 31.—N° 1974.

REHM, AUGUSTE YVES.—" Improvements in crinolines."

This invention "is applicable also for supporting the hood of " mantles."—A spring surrounded with caoutchouc is placed on the inside of the collar; an "ornamental knob" at each end of the spring with "click and spring work at bottom" separates the hoops "to form at will above the head some interior or exterior " angles." The action is obtained "by simply pulling a string " joined to the pawls" of the knobs. "The same effect takes " place with summer bonnets, the hoops of which bend or fold " in the cloth."

[Printed, 8*d*. Drawing.]

A.D. 1865, November 29.—N° 3056.

***BONNEVILLE*, HENRI ADRIEN.**—(*A communication from Alfred Apard.*)—" Improvements in coverings for the head." The inventor makes hats with brims which may be detached from the hat bodies.

The body may be of any suitable form and material; it is provided inside with four rings. The brim is made in two parts hinged together or "folding in their largest diameter;" it is provided with "a vertical projection inside to receive the body." Two india-rubber bands, either single or forked, are attached to the brim "in the line of the largest diameter," and two single bands "in the line of the smallest diameter;" the bands carry at their upper ends hooks which take into the rings.

The body, instead of being secured to the brim as above, "may " be sewn or glued in cases where supple materials are used and " be folded between the brim." In all cases the brim should be stiff.

[Printed, 6*d*. Drawing.]

A.D. 1865, December 14.—N° 3241.

LANCASTER, James.—(*Provisional protection only.*)—"Im" provements in the manufacture of navy, yachting, and other " seamen's hats." These hats are made of calico stiffened with size or other stiffening matter, "and blocked on to the shape " required, leaving the crown slightly convex." The brim is pressed or blocked so as to turn up the edge all round "and thus " produce a concave or dished rim." The outer surface and the under side of the brim are painted and varnished and thus rendered perfectly waterproof.

The weight of the hat is about 5½ ounces; and from its construction it is "a seamless hat."

[Printed, 4*d*. No Drawings.]

A.D. 1865, December 19.—N° 3281.

NEWTON, William Edward.—(*A communication from the Eickemeyer Hat Blocking Machine Company.*)—"Improvements " in machinery for the manufacture of felt hats." This invention relates to (1) machinery for stretching the hat body preparatory to blocking and shaping, and (2) machinery for blocking and shaping the hat body.

1. This is composed principally of (1) a ribbed skeleton block, (2) a circular clamping instrument or series of clamping instruments, and (3) one or more circular series of rollers for applying

pressure upon the parts of the body between the ribs of the block whilst the body is held thereon.

The block is placed concentrically on the top of a sliding spindle; it is made in two parts, the lower consisting of ribs and a central hub to which the ribs are attached, the upper of "a ring " or complete circular portion" and half as many ribs as in the lower part. The two parts are so fitted together "that either can " be changed for one of larger or smaller size." The edges of the lower ribs are notched or roughened.

The "clamping fingers," equal in number to that of the upper series of ribs, are attached to a horizontal ring. The ring is suspended from a circular plate. The plate "is arranged upon a " stationary vertical screw" which is secured in the middle of a horizontal circular plate on the top of the frame of the machine. The inner faces of the fingers are so grooved that, when the block is in a proper position, "each may overlap both sides of " one of the upper ribs" and one of the lower ribs "which is in " a line with that upper rib."

There are "two circular series of thin round-edged rollers," the upper series corresponding in number with the upper ribs, the lower with the lower ribs, and all "operating between those ribs." The pressure of the upper rollers is regulated by springs connected to levers which carry the axles of the rollers, the pressure of the lower ones by a loaded lever. This lever is adjustable as to height "by being connected with a rocker" for the purpose of " stretching the hat body more or less at the crown;" the same effect may however be obtained by providing for the raising or lowering of the block on its spindle.

2. The improvements consist mainly "in the employment in " combination with the hat block of what may be termed a band- " ing shell and a banding ring." The block stands on a plate secured upon the upper end of a sliding spindle. The banding shell is "a thin, hollow, upright, open-bottomed cylinder of " metal," the interior diameter of which is large enough to admit the block with the body thereon; it is secured to the upper part of the frame concentric with the block. The hat brim is held between plates, the lower of which has circles inscribed on it for placing the brim concentrically on it; "its central opening is " larger than the exterior of the banding shell," and into the opening is tightly fitted the banding ring for forming the band of the hat, viz.,—"the angle between the brim and the side crown."

The Specification contains very full particulars of each machine and of the operation of each.

[Printed, 1*s.* 6*d.* Drawings.]

A.D. 1865, December 23.—N° 3325. (* *)

NEWTON, William Edward.—(*A communication from Henry Wurtz.*)—" Improvements in the preparation of glue or gelatine " so as to render it insoluble in water, and applicable by the " admixture of other substances to various purposes for which com- " mon glue or gelatine cannot now be used." The prepared glue or gelatine may be applied to a great variety of purposes, among which is mentioned stiffening hat brims.

A change is effected in common glue or gelatine, "so that " without being deprived of its gelatinizing power it will become " in the process of drying converted into a substance which is " insoluble in water," by heating it "in the form of a strong " solution in water together with a strong solution of chromic " acid or of an alkaline bichromate." For a coating or a sizing, the article to be operated on is soaked "in a hot solution of " common glue which is then allowed to gelatinize on it by cooling, " and is subsequently modified by the application of the bichro- " mate either in cold or in hot solution." For the other purposes mentioned, the preparation "should be used in a rather dilute " form;" if desired, it may be coloured with soluble colours " such as those obtained from aniline."

[Printed, 6*d.* No Drawings.]

A.D. 1865, December 23.—N° 3334. (* *)

HURN, George, and HURN, Daniel.—" Improvements in " obtaining and employing continuous lengths of tanned leather " for various useful purposes."

"The continuous lengths are cut" from the hide "by causing " the knife or instrument, set to any required guage, to traverse " the entire surface of the skin, so as to divide it into an endless " piece or coil, which is subsequently submitted to longitudinal " stretching, damping, greasing, or hammering, as may be found " necessary for straightening or removing the angles." Amongst the very numerous articles to which the leather bands may be applied, "hats, caps, or bonnets, trimmings for hats, caps, and

" bonnets, and bands for hats and caps" are mentioned, but the manner of application is not given.

[Printed, 8*d*. Drawing.]

1866.

A.D. 1866, January 1.—N° 2.

CROXALL, JOSEPH BOONHAM.—(*Provisional protection only.*) —" Improvements in ventilators and mirrors for hats and other " coverings for the head." A disc of metal, having a hole in its middle surrounded with projecting points and a cylindrical rim around its periphery, has the rim perforated with a series of holes for the passage of air. Or a series of claws may be made on the outer edge of the disc, the air passing through the spaces between the claws.

On the summit of the rim is fixed a convex mirror, resting on a shoulder at the top of the rim. It is fixed by a separate rim, the edges of which are turned over the edge of the mirror and that of the rim of the ventilator respectively. Where claws are used, the mirror is fixed by the ends of the claws being turned over its edge. Such mirrors may be made of glass having a reflecting surface produced by "quicking;" but others may be employed. The ventilator is attached to the hat by the lining or tip, the points described being passed through a hole in the tip, and clenched by being turned outwards. When a mirror is not required, a disc "of any non-reflecting" material may be substituted.

[Printed, 4*d*. No Drawings.]

A.D. 1866, January 1.—N° 10.

MONTAGU, MONTAGUE.—(*Provisional protection only.*)—" Im-" provements in the manufacture of hats and other coverings for " the head." This invention consists in fixing inside the hat a mirror, " either of silvered glass, polished obsidian, a magnifying " mirror, or other reflecting surface." The mirror should be *mounted* in a light frame, and be secured within the hat by metal *clips or other* fastenings.

[Printed, 4*d*. No Drawings.]

A.D. 1866, January 16.—N° 143. (* *)

SAMWELLS, John, and NYE, Samuel.—"A new method of "and apparatus for washing straw and other plaits and other "substances, and for domestic washing purposes." This invention consists in the mode of combining "three motions" and in the application of "Lovett boards."

Two tanks are constructed, and on the top of the tanks frames "rest on a rule-jointed ledge," which "is pinned in the centre "and at each end with wooden pins." These frames are fitted with rods, from which "the plait or other substance to be washed "is suspended." The frames are caused "to be moved in a "vertical motion by means of a bar affixed to each frame and "moved by cog wheels and a double crank and "fly wheel."

A second or perpendicular motion known as dipping is produced" by taking out the two end pins in the "rule-jointed "ledge, which allows them to drop, and the frame is then worked "up and down."

A third motion is produced "by means of a Lovett frame fixed "by pins in the bottom or middle of the tanks, which Lovett "frame if fixed at the bottom is attached to the upper frame by "a cross bar extending from and fixed by loose screws to the top "and bottom frames."

By the above means "the first or horizontal and third motion "and the second or dipping and third motion are attained at one "and the same time."

In "a small plait washing or domestic washing machine" the cogs and crank are dispensed with, and the top frames are worked by means of handles; and where the dipping motion is not required, the side bars are dispensed with, and the Lovett boards are attached to the top of the frame, which gives the first or vertical motion. This first or vertical motion is also obtained "without using a top frame, but simply connecting the bar with "the Lovett boards themselves."

[Printed, 6*d*. Drawing.]

A.D. 1866, January 16.—N° 147.

MANN, William Charles.—"An improved method of making "felt hats." The object of the patentee is "to cheapen the cost "of production" by making felt hats "sectionally." He makes the crown of one or more pieces, the side of two pieces, and the brim of one piece, and connects them all by sewing.

He puts over the seams a braid or other ornamental substance; or he embosses "an ornamental groove on the substance of the "hat itself."

[Printed, 4*d*. No Drawings.]

A.D. 1866, January 20.—N° 188.

NEWTON, William Edward.—(*A communication from Nicholas Bunning Hooper.*)—"Improved machinery for pressing and "ironing hat bodies." A frame supports a horizontal bed-piece. A vertical shaft is placed centrally in the frame; its lower end is stepped in a cross bar. A circular disc is fixed on the upper end of the shaft; it works in a circular opening in the bed-piece; the upper surface of the disc and the bed-piece are flush with each other, and a hat block is secured by pins on the disc. The hat body is put on the block, and the edge of the brim is kept to the edge of the lower part of the block by a band, whose ends are connected by a spiral spring. When the machine is at work, a frame is secured to the bed-piece at one end by a pivot, and at the opposite end by a groove, into which the edge of the bed-piece fits.

Three irons, each "of rectangular form in its transverse section," are required, two on one side and one on the opposite side of the block. The upper iron, by means of a bar, a loaded lever, and a carriage (sliding on the frame), irons the crown; it is "provided "at the outer side of its bottom with a pendent flange," which is pressed "against the side of the crown" by aid of a loaded T-shaped lever, having its fulcrum in the frame.

"At the inner side of the lower part" of the lower iron there is "a laterally projecting lip," which is pressed by a loaded lever "against the lower part of the crown of the hat at its junction "with the brim." The iron is pressed down on the brim by another loaded lever.

The iron on the opposite side has neither flange nor lip; it is arranged by means of rods, spiral springs, and a T-shaped loaded lever, to press and iron the side of the body; the springs admit "of the iron yielding to conform to the oval form of the crown "as the hat block rotates."

To iron the under side of the brim, "a hollow block is used "and secured in an inverted position in the upper end of the "shaft." The lower iron "acts upon the under side of the brim "in the same manner as it acted upon the upper surface."

The irons are heated by gas; each has "a horizontal partition within it," and is "open at one end to receive gas burners."

A full description of the arrangement of the irons is given in the Specification.

[Printed, 10*d*. Drawings.]

A.D. 1866, January 26.—N° 264.

NEWTON, Alfred Vincent.—(*A communication from Alfred Clark Brush.*)—(*Provisional protection only.*)—"An improved "mode of treating fur, wool, and hair." By means of this invention these substances are prepared for hatters "in a clean "and sweet condition without discolouring them and without "destroying or impairing the natural felting properties."

The substances are subjected to the action of steam in a closed vessel for about thirty minutes. The pressure of the steam "varies with different kinds and conditions of stock" from 60 lbs. or even less to 250 lbs.; it may be carried to 400 lbs. without injury to the material "so long as the steam remains "moist and superheating is avoided." Any suitable vessel may be employed having a "perforated or reticulated false bottom" to support the material and allow the condensed water and oil or grease or other matter to run off.

[Printed, 4*d*. No Drawings.]

A.D. 1866, February 8.—N° 395.

SIMON, Samuel Bruckshaw.—(*A communication from John Thomas Jones*).—(*Provisional protection only.*)—"Improvements "in the manufacture of hats and in apparatus employed therein." The felt is put on "a conical frame consisting of a number of "ribs or bars arranged at uniform distances apart around a "central axis." Over the frame is "another consisting of a "number of arms with friction pulleys at their ends." This frame is forced down on the felt "in such manner that each of "the friction pulleys enters between two of the ribs." As the outer frame descends, the arms carrying the pulleys "are governed "by a suitable pattern or form, which causes them to enter "between the ribs to any desired extent and stretch the felt at "the points required." In this way "the formation of a brim "is commenced."

The felt now passes to another apparatus, "in which its "edge or brim all round is held tight between two discs;" it is forced on to "a cylindrical form which is open at the end," and a plunger "comes against the portion of the felt which is strained "over the top of the cylinder" and "pushes it into the interior "of the cylinder." In this manner "the whole of the felt which "forms the sides of the hat is, whilst tightly strained, drawn "over the edge of the cylindrical form" and is "quickly brought "approximately to the shape required."

The felt should be kept hot and moist by means of steam whilst undergoing the treatment above described.

When removed from the apparatus "the hat is finished as "heretofore."

[Printed, 4*d*. No Drawings.]

A.D. 1866, February 10.—N° 428.

HART, George.—(*Provisional protection only.*)—"Improvements in the manufacture of hats, caps, and other coverings "for the head." The body is formed of felt, gossamer, calico, or other suitable material; it is blocked in the ordinary manner, and the exterior surface is coated with japan varnish.

The chief object of the invention being to make a head covering suitable for hot climates, "a helmet-shaped block and corresponding pattern of covering to shade the eyes and back of the neck" are preferable, and the coating should be of "white japan."

[Printed, 4*d*. No Drawings.]

A.D. 1866, February 13.—N° 455.

VERO, Joseph.—"Improvements in machinery for felting the "bodies of hats and other coverings for the head." A dripping trough is mounted between the two side frames, and a planking board in front of the framework. The side frames carry three rollers in a horizontal position over the trough. The rollers are "at an angle acute to each other as well as being in proximity "to each other;" they have either worms chased upon their "peripheries extending from each outer end and towards the "centre and there meeting" or strips of lead or other suitable metal coiled round them in the manner just described. An upper roller is mounted in a weighted frame "capable of swinging upon "the axis of the roller at the back of the machine;" although when in position the upper roller rests over the centre and lower roller. The upper roller is screwed or wormed in manner similar to the lower ones.

As the main work of felting devolves upon the upper and middle lower rollers, the other two (which serve to prevent the escape of the body under operation) may be left plain.

The bottom rollers may be made "two or three times the " length of the top one," and there may be two or three moveable top rollers "having independent frames" and "geared " independently of each other."

[Printed, 8*d*. Drawing.]

A.D. 1866, February 27.—N° 597.

HILL, Charles Grey.—(*Provisional protection only.*)—"Im-" provements in machinery or apparatus for cutting lace fabrics " to make them into bonnet or cap fronts." Two methods are described for shaping the edge or edges of lace "by cutting, " stamping, or punching."

1. The lace is folded and placed between two plates, whose edges "are made of the required forms." The lower plate is secured to a bed, and the upper one is brought down upon it " by means of a bar connected with it and worked by a treadle," or by "a cam or cams and levers, or other equivalent contrivance." The edges of the lace "are operated upon by a knife or other " cutting instrument."

2. A bed plate is "pierced with the required continuous shape." Above this plate is another similarly pierced, through which pass a series of punches or cutters of corresponding shape with the piercings in the bed plate. The punches or cutters and the upper plate are worked by hand or foot or cams and levers.

[Printed, 4*d*. No Drawings.]

A.D. 1866, March 14.—N° 765.

CLARK, William.—(*A communication from James Lyall and William Lyall.*)—" Improvements in apparatus for ironing and " finishing linen and other fabrics." This invention may be used "for finishing hats and generally for putting a finish on " goods and fabrics, especially such as require a glossy appear-" ance;" it is described in its application to "ironing shirt " bosoms."

The improvements consist in "the use of a rotating hollow "cylinder heated by gas or other means and revolved at a high "speed in combination with a feeding device for feeding the "article to be operated on moved at a comparatively low speed." The left end of the cylinder is open to the atmosphere; the right end revolves in a stationary box connected with a chimney which carries off the products of combustion. The gas pipe (which terminates in the cylinder) is provided with a cock on whose case is a graduated dial, and an index connected to the cock "indicates by its position how far the cock is turned." The cylinder "is suspended by means of frames" from the main shaft, which is suspended in bearings "capable by a rocking action or other-"wise of being raised and lowered as occasion requires" to bring the ironing surface into contact with the article to be acted upon. The rock shaft is worked by means of a treadle. On the left end of the cylinder is a wheel in gear with one on the main shaft, so that "the cylinder is kept in constant motion while power is "applied to the shaft." On the other side of the shaft is a wheel engaging with other gearing "which gives motion to a corrugated "feed wheel;" this "has bearings within the forward end" of a table (underneath the cylinder), over which (or a supplementary table) the article is placed. The feed wheel "projects a little way "above the surface of the table" in order to take hold of "the "bottom of a supplementary or bosom board."

The various parts of the machine and the method of working it are described at length in the Specification.

[Printed, 1*s.* 2*d.* Drawings.]

A.D. 1866, March 15.—N° 775.

MORSE, MONROE.—"An improved machine for pressing straw "hats and bonnets." The mould "constitutes one end of a "hollow drum," which holds steam for heating the mould. The drum and mould are supported by three legs, to two of which "a vibratory" head is connected by two arms hinged at the lower ends to the legs. The head holds "a solid elastic presser" of vulcanized india-rubber or other suitable material "formed "so as nearly to fit to the concavity of the mould." At its *rear it* bears against "a series of moveable sectional plates ap-"*plied* radially to the head and a disc arranged concentrically "*within* a circular aperture made within the head." The plates "move inward at their inner ends when the disc is pressed "inward." The disc is fixed to a screw supported in a cross bar which is fixed to the head, and on the screw is arranged a bar capable of being revolved thereon and adjustable by a nut as to its distance from the disc. The bar "is to operate with two slide "bars" which are disposed on opposite sides of the drum and clasped thereto. Pins are inserted in each of the slide bars. There are connected with the drum and a bar "which joins the "two slide bars at two of their extremities" two pairs of toggle joints, each connected by a toggle with a third toggle "which "constitutes the shorter arm of a bent lever or treadle." A weight serves to counterbalance the head. "A bolting apparatus" locks the head to the mould "while the toggles may be out "of action."

The working of the sectional plates, the arrangement of the pins, and the construction of the bolting apparatus are explained in the Specification.

[Printed, 8*d*. Drawing.]

A.D. 1866, April 19.—N° 1105.

DALES, Charles.—(*Provisional protection only.*)—"Improvements in eye-glasses usually termed shooting glasses or hat "frames, which improvements are also applicable to other "spectacles." The stem of these glasses is fixed in the hat brim or cap peak in the ordinary manner. The improvement consists in the use of ball-and-socket joints whereby the glass can be turned round freely in any direction.

A ball is formed "on the end of the stem by which the glass is "held and fixed," and another "on the stem projecting from the "eye or glass frame;" these balls are pinched "between two "short bars having little cups" to receive them, and the bars are "pinched together by a pinching screw with thumb head." By such arrangement the pressure on the balls can be regulated as well as "the stiffness with which the ball-and-socket joints "move."

[Printed, 4*d*. No Drawings.]

A.D. 1866, April 21.—N° 1131.

TAYLOR, John George.—(*Provisional protection only*).—"Improvements in dress fastenings and ornaments." The first improvement relates to the manufacture of "clasps for buckles "without joints or rivets;" they are made by preference of hard india-rubber, horn, shell, or aluminium.

The second, to combining metals with the above materials; the buckle frame is made of hard india-rubber "ornamented with "a metal chain surrounding the buckle, the clasps of which are "also of metal."

The third, to making buckles entirely of metal, in one or more parts, "having a plate substituted for the clasp, also of metal, for "covering the opening in said buckle."

The fourth, to making "chains, used for ornamenting ladies' "hats;" they are composed "partly of leather or hard india-"rubber combined with steel or other metal."

The fifth, "to pins for shawls, hats, or for the hair;" the stems and the heads are connected by hooks and eyes.

The sixth, to "hollow ornaments in imitation of cameos, birds, "and other similar objects;" they are stamped out of "silk, "alpaca, and other textile materials," and have a piece of linen, cotton, or other substance pasted to the back.

[Printed, 10*d*. Drawings.]

A.D. 1866, May 7.—N° 1295.

DE TIVOLI, VITAL.—(*A communication from Major-General Angelini.*)—(*Provisional protection not allowed.*)—"A new system "of application of pads of india rubber or other elastic materials." These pads are made in the form of "tubes or of thick sponge or "of any other form" and shaped to the parts to which they are to be applied or the article of dress into which they are to be put. Among the purposes to which they are applicable are linings for helmets and other head coverings, linings for leggings, and socks for boots and shoes.

[Printed, 4*d*. No Drawings.]

A.D. 1866, June 7.—N° 1572. (* *)

FRIEDMANN, JOSEPH JULIUS.—(*A communication from Maximilian Friedmann.*)—"An improved preparation of materials appli-"cable for the manufacture of hats, caps, bonnets, coats, cloaks, "gaiters, and other articles of clothing, pouches, portfolios, and "other articles of capacity for enclosing various useful articles." Very thin sheets of cork are bespread with "a thin film of gutta

" percha, india-rubber, or other gum dissolved in any suitable " solvent, or an elastic preparation or compound which has " sufficient elasticity and is capable of being softened by the " application of heat." When the film is laid quite smooth on the sheet, a piece of textile or woven material is placed upon it; heat is applied to the surface of the material to soften the gummy matter, and the whole may if desired be submitted to the pressure of a screw or hydraulic press, " the bed of which should be made " hollow and be heated by steam." This pressure will cause the two substances to adhere firmly together "and produce the " compound fabric required."

[Printed, 4*d*. No Drawings.]

A.D. 1866, June 8.—N° 1575.

ABEL, Charles Denton. — (*A communication from Zoheth Sherman Durfee*).—" Improvements in travelling bags, valises, " and trunks." The inventor combines with these articles "a " box or receptacle for carrying hats or bonnets" in such manner that although the box is inside the article, " access is gained to it " by means of a separate cover without having to open" the article.

To combine a hat box with a travelling bag:—A rim is constructed of any suitable material and by preference oval in shape. An "inverted flanged box" is secured to the rim, the flange forming the bottom of the bag. It is preferred to make the box of thin sheet metal "with corrugations running around its sides " and radially or otherwise on its flange." A cover is fitted into the rim; it is provided with a handle which can be turned aside when not in use; it is fastened into the rim by bolts or locks. Space must be left between the cover and the flange to admit the brim of the hat, and buttons on the flange retain the hat in the box when the cover is taken off. To utilize the space inside the hat or bonnet a box of suitable size is fastened upon the inner surface of the cover; this box may be made in two parts united by preference with an elastic band; it may be attached to the cover so as to be removable therefrom. "The modes of fastening " the top or bag to the hat box may be various."

To combine a hat box with a pormanteau:—Instead of the portmanteau "being divided in the middle" it is "deeper in the " bottom than in the top part." The hat box is " flanged and

" riveted to the side of the portmanteau and turned over at the " end." The cover has " stiffening pieces " applied to it, and its handle " is made flush with a recess for the fingers."

[Printed, 10*d*. Drawing.]

A.D. 1866, July 17.—Nº 1863.

RICHARDSON, John, and YEOMANS, John.—(*Provisional protection only.*)—" An improvement in the manufacture of " hats." This invention " relates to hats to be worn in time of " mourning;" it consists " in cementing the band to the body of " the hat in the process of manufacture."

The inventors cover the brim, the crown, and a depth down the side according to the proposed width of the mourning band, with silk plush. They cut the edge of the plush even, and apply the band with cement in such manner that its upper edge slightly overlaps the lower edge of the plush. They then finish the hat in the usual manner.

[Printed, 4*d*. No Drawings.]

A.D. 1866, August 23.—Nº 2173.

BAYNE, Walter.—(*Provisional protection only.*)—" An im- " proved hat stretcher." This instrument consists of a frame carrying four moveable blocks " which approach each other at the " centre and have a round contour to suit the ordinary oval shape " of a hat." The blocks are separated equally from each other " by a moveable tapered cross which fits into slots." The cross is raised or lowered " by a small bar or lever underneath the " frame." Pressure is obtained " by the blocks being forced " out by means of right and left handed screws at right angles " to each other." Each opposite pair of blocks being forced out or drawn in at the same time, " any portion of the hat may be " stretched."

[Printed, 4*d*. No Drawings.]

A.D. 1866, August 25.—Nº 2194.

CLARK, William.—(*A communication from Charles Mossant.*)— " Improvements in felting hats and other felted fabrics, and in " apparatus for the same." The framing of the machine stands on six uprights supporting a cast-iron box which is divided into two equal compartments. The upper surface of the box is covered with any suitable fabric, and the felting is performed thereon. Two moveable frames are disposed above the compartments; they run on the box by aid of friction rollers. Each frame "is furnished on two parallel sides with spaces or cavities "disposed opposite each other at equal distances, and serving to "receive the two ends of rods or spindles," round which the hat cones are passed. Each rod "is divided into two semicylindrical parts hinged at one end and closed at the other by a "ring;" the cone is held firmly between the parts "during the "to-and-fro motion of the frames." Only one frame acts at a time.

A varying pressure is exerted on the rods in the following manner :—A cast-iron frame runs on edges of the box by aid of friction rollers carried by four uprights. Inside the frame is another frame rising and falling in grooves. The inner frame "has on its inner surface on two parallel sides hollow cylindrical "parts cast thereon;" in each part are a "through groove" and a spiral spring. Metal bars, "furnished at bottom throughout "their whole width with grooved wooden bars," have their ends received in the grooves below the springs. To vary the pressure each of the four uprights is furnished at its upper part with a screw bearing on the inner frame, and each screw is surmounted by a pinion connected by an endless chain. By imparting motion to one pinion the screws "will turn in the same direction," and raise or lower the frame.

Reservoirs containing warm acidulated water are placed above the machine; a horizontal pipe connected thereto runs the whole length of the machine; the pipe is perforated so that the water "is discharged in small jets on to an inclined plane or cover for "protecting the endless chain," and thence through the spaces on to the box in contact with the hat cones. Taps allow the water to be discharged on to either of the two moveable frames "according to whether the operation is being effected at one side "or other of the machine." A steam pipe, passing down under the machine, branches off into two parts and supplies steam for maintaining each compartment at a suitable heat.

The inventor gives a lengthened explanation of the mechanism by which he connects the foregoing parts and sets them working. He also reserves the right of "varying the mechanical combinations for effecting the several movements without departing "from the principle of the invention."

[*Printed*, 1*s*. 4*d*. *Drawings*.]

A.D. 1866, September 7.—N° 2299.

JOHNSON, John Henry.—(*A communication from William Henry White.*)—"Improvements in hats or coverings for the head, "parts of which improvements are applicable to parasols and "fans." The first part of this invention relates to "forming and "holding in shape" hats and caps made of any light textile fabrics; the second to the construction of "a lining which can "be easily detached from or adjusted to the hat;" the third to "the construction of the sweat-band."

1. The hat former or frame consists of "two concentric hoops "united by braces;" both hoops and braces "may be subject to "many modifications in form." The "hat wrapper" is made of a suitably shaped piece of fabric sewn together so as to form a cylindrical piece; it is made with "three parallel draw-cases," one at the upper end, one about midway, and one at the lower end; each is provided with a draw-string. The frame is placed within the wrapper "between and parallel with two of the draw-"cases." The strings are drawn so as to contract the two ends. The top portion "is then drawn through the larger opening," and "the whole is inverted." The larger opening "now forms "the border of the hat crown at and above the rim of the hat," and the middle draw-case "determines the size of the hat around "the head." Drawing the top string closes the opening in the top; the middle string is drawn to suit the size of the head, and the bottom string "to stretch and fit the wrapper over the "frame."

The patentee describes a modification of the foregoing.

"To give shape and stiffness to the crown" an "expanding "and compressible spring frame" is placed inside the hat; it consists of two hoops connected by angular or helical springs; the ends of the hoops run in clamps, so that the hoops can be varied in size.

2. The detachable lining is a suitably shaped piece of fabric. The top opening is provided with a draw-case and string, "and "around its interior a short distance below the top and parallel "therewith" is another case and string. A hoop is placed between the cases, which are contracted so that the lower one forms a shoulder for supporting the hoop, and the upper one draws the upper edges together to form the top of the lining.

3. The sweat-band is "a thin flexible and elastic band of steel, " hard rubber, vulcanite, or other similar material;" it is composed of strips provided with flanges, "the object of which is to " snugly house or encase the draw-case and draw-strings so as to " prevent their displacement." An upper flange "is intended " to afford means by which a lining can be stretched over it." The sweat-band and peak of a cap "may be formed of hard rubber " in one piece." The lower part of the band "may be continued " so as to form part of the rim of a hat."

[Printed, 10*d.* Drawing.]

A.D. 1866, September 17.—N° 2389.

BOUSFIELD, GEORGE TOMLINSON.—(*A communication from Philip Wheeler Somers.*)—" Improvements in the art of felting or " sizing hat bodies and machinery therefor." The bats are rolled up in cloths in which the coils or folds "are in a reversed direc- " tion to the coils or folds of the bat." The machinery required for felting the bats is of the following construction :—An " end- " less moving table, constructed of light wooden grooved bars," is secured to endless chains which are carried by drums. A horizontal bearer, " projecting inwards from the side rail of the " frame that supports the drums," forms a guide and support between the drums for the table "against the pressure of the " rolls." A " lower yielding adjustable bed" is made in two parts hinged together, so that " the middle of the bed may be " depressed to compensate for the sagging of the lower member" of the table. The middle of the bed is supported by four bent springs. Chains depend from the hinge plates, whereby " the " middle of the bed can be depressed against the pressure " of the springs and be held in place by hooks. The floor of the bed " is made of short boards finely grooved (like a wash-board) " transversely to the line of travel" of the table, and a channel runs along each side "to conduct the water expressed from the " bodies away from the machine." Four guide rods attached to the lower side of the bed "fit loosely in corresponding holes" in cross planks; around them are coiled springs "that support the " ends of the bed with yielding pressure." The bed is adjusted as to distance from the table by two arms and catches. The upper platform is a board "loosely suspended at four points" from cross bars by coiled springs or leather straps; it may carry a weight on its upper side; the lifting by the pressure of the rolls may be regulated by a hooked link and staples. "The concave" is "composed of two sections, both of them grooved like the "lower bed." The lower section "is backed up" by springs placed between it and standards "rising from the lower bed;" the upper section is held by arms hinged to the standards and kept in place with yielding pressure by bent springs. Inclined guides of bent rod iron "prevent the concave from being thrown out of "proper adjustment when the bed is raised or lowered." A sliding bed "rests on that part of the lower bed which projects from "the front of the machine;" on its upper surface are "two con-"cave surfaces inclining in opposite directions." The surface next the table "is a plain surface and forms an inclined throat or "shoot down which the rolls are carried into the machine;" the other is corrugated and serves as "a receiving table for the rolls "that are discharged;" a stop prevents the rolls from rolling off. A rectangular throat valve, according to its position, forms "a "bridge over the throat to throw out the rolls," or lets "the rolls "pass round again in the machine."

The method of rolling up the bats and the working of the machine are described in the Specification.

[Printed, 1*s*. Drawings.]

A.D. 1866, October 8.—N° 2584.

STAR, Moritz.—(*Provisional protection only.*)—"Improvements "applicable to caps and other coverings for the head for naval, "military, and general use." The following are the directions for making a cap:—Form the foundation of a band of cardboard or other suitable material. Construct a cap "for fair weather" (without a foundation) of cloth or other fabric. Divide the band into two equal parts in a vertical direction, and add "an ear piece "or lappet" to the "ends of the back portion." Construct a cap of oil silk or other suitable material, "an exact counterpart" of the cloth cap and having a divided band. Sew "the ends of "the semiband of the cloth portion of the cap" to "the ends of "the half band" of the oil silk. "Turn the oil silk cap so as to "bring the lower edge of the band in line with the lower edge of "the cloth band," and sew them together "between the two "lappets or ear pieces." Take the double cap, "slip the band" on to the foundation band, "attach the woollen cloth part of the

" front thereof and the oil silk portion of the back to the back " part of the foundation," fasten on a button or hook "on " each side of the front of the cap on the woollen cloth portion " thereof for buttoning the lappets or ears to" when the cloth portion is at the outside, and "attach two buttons on the " oil silk portion of the band of the cap, to which the ears or " lappets are fastened when the oil silk surface is on the outside."

The cap may have a "cape piece" of oil silk or other suitable material connected to the back by sewing, hooks, or buttons, so as to form "a portable southwester."

The cap may be constructed "with a threefold exterior covering, either of which may be "turned to the outside."

A peak may be attached in the ordinary way.

[Printed, 4*d*. No Drawings.]

A.D. 1866, October 19.—N° 2703.

HAWORTH, JAMES.—(*Provisional protection only.*)—" Improvements in the manufacture of hats or coverings for the head and " in apparatus connected therewith." This invention relates to an apparatus for "cutting off or rounding" the brims of hat bodies.

"A curved guide" is employed "in combination with two revolving discs acting as cutters;" it is "attached to a graduated " bar which is mounted in slides on the framing of the apparatus, " so that as the guide is moved farther from or nearer to the " cutters the width of the brim is regulated." A thin metallic plate, of about the same width and curve as the guide, is attached to the front surface of the guide, and at each end thereof "two " adjusting screws are arranged so as to set out the termination " of the thin plate beyond the guide."

The brim is placed on a table, "which revolves on a pivot on a " bracket projecting from the framing;" the rough edge of the brim is passed between the cutters, "which are secured at the end " of two shafts;" and as the handle on the driving shaft is turned, " the action of the cutters cuts off the superfluous part of the brim " and causes the hat to advance towards the cutters and the table " to rotate." The body is placed against the guide; if the brim is to be cut to a regular width all round, the plate "is allowed to " bear against and be of the same curve as the guide;" but if the brim at the sides is to be left wider for curling, the ends of the plate "are set out by the screws, so that as the body revolves, this "plate forces and guides the hat farther away from the cutters "at such parts."

[Printed, 4*d*. No Drawings.]

A.D. 1866, October 27.—Nº 2777.

TUESKI, BERTHOLD.—(*Provisional protection only.*)—"Improvements in the manufacture of hats." The improvements relate to "the curl" of the brim.

The inventor proposes "to form the brim of the hat at once to "the size or breadth absolutely required, and to cut the curl out "of any suitable material." He affixes this separate piece to the brim by sewing or by any adhesive substance. He cuts the curl with a knife "made to suit the shape of the intended curl" by preference, but scissors or other instrument may be used.

[Printed, 4*d*. No Drawings.]

A.D. 1866, October 29.—Nº 2787.

GEE, JAMES.—"Improvements in the ventilation of hats or other "coverings for the head." The improvements consist in the application of air channels at each side of the hat and in the use of elliptically shaped escape openings in the crown. The air passages at the sides are situated at that part which extends over the temples of the forehead, and are of a conical form, being wider near the brim, and tapering upwards or *vice versâ*. They are fixed at an inclination towards the opening at or near the crown, which may be in either the front or back part of the hat. The passages may be made of thin leather or cork, or thin steel, or of brass plate, and situated in the body of the hat or between it and the lining leather; or they may form part of the lining. An excessive current through the hat may be checked by closing the outlet at the crown by means of a plate which turns upon a centre pin and fits the aperture when closed.

[Printed, 8*d*. Drawing.]

A.D. 1866, October 29.—Nº 2789.

WARD, JOSEPH EDWIN.—(*Provisional protection only.*)—"Improvements in machinery for the manufacture of hats or "coverings for the head." The first part of this invention relates to the mould to be used in "moulding or pressing a

" certain form of felt and other hats, that is, such as will not " withdraw from the mould when pressed into the shape desired." The mould " is first cast as a complete mould, then finished internally and externally;" it is then " broken into two halves, being " cast with a thin place in the metal at the part where the fracture is required, the object being to get a jagged joint, such as the " fracture of metal gives in place of a straight line junction that " would leave a mark." The mould is inserted into a corresponding hollow casing which is heated by steam; one part of the casing and mould is fixed to a bed or frame; the other part " is arranged in slides." The moveable part "is actuated and " held firm by a powerful screw, which is locked by another " screw when the mould is screwed up;" other contrivances may be used.

The second part relates " to arrangements for cutting the brims " of hats to a uniform size all round." The hat is kept central in a suitable holder, the brim resting on a block or edge. "A " ring knife of the size and shape of the intended brim" is brought down and cuts out the brim "at one operation by " pressure or percussion."

[Printed, 4*d*. No Drawings.]

A.D. 1866, November 9.—N° 2924.

NEWTON, William Edward.—(*A communication from Benjamin Chew Tilghman.*)—" Improvements in treating vegetable " substances, chiefly applicable to the manufacture of paper pulp, " and fibres." The patentee informs us in one part of his Specification that "straw, grasses, osiers, young woods, and similar " vegetable fibrous substances," may be so treated as " to dissolve " only partially the cementing substance of their fibres" and thereby render them "more flexible and more suitable for " making hats."

When wood is used, " it is to be cut across the grain into slices " about one-eighth to one quarter of an inch long." It is desirable that "plants of nearly uniform size and growth should be " selected to be operated on together, and they are to be left of " their natural length and not cut as in the case of wood."

An iron vessel lined with lead and provided with a steam jacket and the necessary pipes, taps, man-holes, gauges, safety-valves, and thermometers, is "about two-thirds filled" with the substances. A solution of sulphurous acid in water of about specific gravity 1·025 to 1·035 at 60° Faht., in which sulphite of lime has been dissolved sufficient to raise its density to about specific gravity 1·07 to 1·08, "is then run in until the vessel is "nearly full," so that the substances may be kept constantly covered by the liquid. The vessel is then closed, and heat is applied until the temperature of the liquid is about 260° Faht., at which it is to be kept from 6 to 8 hours. The steam is then shut off, and "fresh water is forced into the top of the vessel," the acid solution "being at the same time allowed to escape gradually from below into a covered lead-lined tub." The substances are washed and left to drain, and the process is repeated if necessary; they are then "beaten into pulp by the ordinary "machines."

The patentee mentions modifications of treatment, claiming only the use of a solution of sulphurous acid in water, either with or without the addition of sulphites or other salts of equivalent chemical properties, "heated in a close vessel under pressure to a "temperature sufficient to cause it to dissolve the intercellular or "cementing constituents" of vegetable substances for the manufacture of pulp.

[Printed, 4*d*. No Drawings.]

A.D. 1866, November 13.—Nº 2972.

CLARK, WILLIAM.—(*A communication from Rufina Nöggerath-Temmerman.*)—"Improvements in the preparation or treatment "of fabrics or materials for the manufacture of various useful "articles," amongst which "hat trimmings" are mentioned.

The fabrics used are either "open-knitted lace or net fabrics" or "open or close fabrics made from horse and other hair, esparto, "and generally of all animal or vegetable textile matters."

The fabrics are (1) hardened by drying and moulding; (2) painted or immersed in a dye bath; (3) coated on the surface with a suitable varnish or gumlac; (4) galvanized or metallized "by any known chemical or electrical means;" (5) cleaned and put into an oven "to destroy the textile material forming the "foundation;" (6) dipped in a finishing bath for gilding, silvering, or bronzing.

When the fabrics are intended for hat trimmings they are not to be metallized.

Before submitting the fabrics to the foregoing operations they are to be steeped in a solution of potash (this is "particularly" claimed by the patentee) or in a solution of "size, resin, pyrolig-" neous acid, pyrolignite of iron, gum, creosote, salt of benzoin, " or other products" serving to give the necessary degree of hardness. Other hardening agents may be used.

If a mould is used to give the article the desired shape, it " should be previously coated with a fatty or soapy matter to " facilitate the removal therefrom." After the removal of the article it is to be impregnated with a thin varnish or gumlac mixed with plumbago or with any suitable colour.

[Printed, 4*d*. No Drawings.]

A.D. 1866, December 5.—N° 3193.

BAYLEY, Thomas, and TAYLOR, John.—" Improvements in " the manufacture of hats or coverings for the head, and in " apparatus connected therewith." This invention relates to felt hats, and to that part of the manufacture which is termed " hardening hat bodies."

The apparatus employed is of the following description:—A conical block mounted on a vertical axle receives a regular revolving motion by means of a worm wheel keyed on the axle and a worm on the driving shaft. The block is surmounted by an " oscillating cover which may not revolve." The cover is provided with a rod projecting upwards from its apex. The rod is linked to a vertical rod, whose lower extremity forms the fulcra of two levers. The upper ends of the levers are connected by a cross bar with the vertical rod, and their lower ends are provided each with a clip which embraces a sliding block "placed eccen-" trically on the driving shaft." By this arrangement "a lateral " reciprocating motion is transmitted" to the cover.

The conical felt body (as it comes from the carding machine) is placed on the block and is covered with a loose cover of linen or other fabric. When the apparatus is set in motion, the block revolves, and the cover strikes against the felt in such a manner " as to effect a rubbing or frictional pressure."

" By the peculiar action and combination a thin edge is made " at the bottom of the felt cone which is of advantage for future " formation of the brims."

When the felt cone is removed from the block, it is further hardened by warming it over a jet of steam.

[Printed, 8d. Drawing.]

A.D. 1866, December 20.—N° 3353.

HALL, Samuel.—“ Improvements in the manufacture of gossamer hat bodies.” The patentee connects the brim with the body by means of a band “ of elastic flexible plait or weaving of Brazilian grass or palm leaf,” or of other substance capable of being made into a similar flexible and elastic plait. The band is shaped by stretching over a block, and is caused (when necessary) “ to “ take the desired set or form by moisture and ironing.” It is preferred that the edges of the band “ should be inserted between “ the substances of the crown and brim and be fastened to them “ with shellac dissolved in spirits of wine.” The size of the band is by preference “ about $\frac{7}{8}$ths of an inch in the crown, $\frac{1}{2}$ an inch “ of which is inserted between the substances of calico, and $\frac{5}{8}$ths “ of an inch in the brim, $\frac{3}{8}$ths of an inch of which is also inserted “ between the substances.”

A thickness of calico, stiffened with shellac and ironed to the brim at the part “ where the gossamer ends and the “ Brazilian “ plait commences,” affords a smooth surface (if it is preferred to cut out a portion of the inner edge for the reception of the band) “ on which the covering material may be attached.” A piece of waterproof cloth attached to the ends of the body and brim will render the band water and grease proof.

The body thus made is covered with any of the ordinary fabrics.

[Printed, 6*d*. Drawing.]

APPENDIX.

A.D. 1783, December 1.—N° 1404.

VANBUTCHELL, MARTIN.—"New spring bands or fastenings "for the apparel or furniture of man or beast, which bands or "fastenings by their reaction or small friction were more easy, "safe, or lasting than other bands or fastenings." These bands or fastenings are composed of silk, catgut, hair, thread, and such like materials "twisted or curled so tight as the material will bear" and laid in "straight, cross, diagonal, and all other lines," and of wire of any metal wound into spiral springs. The wire may be covered with silk twist, mohair, thread, &c., and the springs may be covered with gold or silver lace, ribbon, &c. The bands are fixed to the parts to which they are applied by means of buckles, buttons, studs, clasps, hooks, rings, and other contrivances.

These bands are employed by the patentee for every conceivable purpose; he applies them to nearly every article of clothing including hats, bonnets, kerchiefs, hoods and caps, to saddlery and harness, to artificial limbs and surgical apparatus, to articles of furniture, &c., &c.

A hook is described in the Specification; it is made from "a "blanket pin by bending one end into an eye and the other "into a hook."

When the band or fastening is intended for a hat or cap, it "has a joint before and a joint behind, but no joint on either "side, and is divided in or near two equal parts, with one straight "spring or more than one on each side, to take off pressure from "the forehead and hindhead.

[Printed, 4*d*. No Drawings. See Rolls Chapel Reports, 6th Report, p. 168.]

A.D. 1784, July 20.—N° 1444.

PHILIPPE, JEAN.—"A spring or springs made of tempered "steel, either flat or square, upon a principle entirely new, which "is thinner, more supple, and fitter to be used for garters, "bracelets, boots, buckles, lashes, stays and jumps for ladies, "sword and other belts, binders for letters, and bandages of "every sort, also buckles for breeches and waistbands." One figure in the annexed sheet of drawings shows a garter which "goes twice round the thigh." The middle portion consists of "a flat and hard steel spring, the blades of which are somewhat "down to render it more smooth and less thick;" it is an inch and a half long and "ought to lengthen an inch and a half "more;" it is "covered with a ribbon fastened by a silver clasp," and a small double ribbon "goes in and through the said spring "to prevent its breaking when it is too hard pulled." The garter fastens with a buckle.

Another figure shows a garter "intended for those who cannot "bear a ligature round their thighs." "It is a spring like the "former but longer." At one end is a silver plate which is to be placed in a pocket "made in the waistband of the breeches" with a hole for the passage of the spring; at the other end is a hook. For ladies' wear a hook is used instead of a plate. The spring "is covered all over with a skin."

Another shows a garter (similar to the first) which passes only once round the thigh. "The springs are like the former but "longer and covered."

Another shows two springs (united) which are intended for stays. They are "of flat and hard steel, the blades of which are "open," and operate "by closing and shortening." A "silver "blade," goes through "the bones of the stays and the two "springs" and "produces the intended effect."

Another shows an arrangement of springs for "ladies' jumps." There are four springs, the outer two closed, the inner two open; "they operate together and their movements are very easy."

Another shows a spring fastened to a buckle which may serve for "all sorts of buckles." The spring is "of hard steel, but "bigger, wider, and shorter than the former;" it is secured to the chape, "is directed by two steel blades," and "lengthens and "shortens as is required."

Another shows a spring for boots. It is about 2½ inches long with a button at each end. One button is put inside, the other outside the boot; "the outside one fastens to the breeches."

Another shows a spring having a hook at one end and an eye at the other; "it serves for hats, bracelets, bandages, ruptures, "letters, ligatures, &c."

[*Printed*, 6*d*. Drawing. See Rolls Chapel Reports, 6th Report, p. 163.]

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Cheltenham (*Literary and Philosophical Society*).
————— (*Permanent Library*).
————— (*Working Men's Club*).
Chertsey (*Literary and Scientific Institution*).
Chester (*City Library and Reading Room*).
Chesterfield (*Mechanics' Institution*).
Chichester (*Literary and Philosophical Society*).
———— (*Literary Society and Mechanics' Institute*).
Chippenham (*Literary and Scientific Institution*).
Christchurch (*Working Man's Institute*).
Clevedon (*Village Hall Institution for Working Men*).
Cockermouth (*Mechanics' Institution*).
Coggeshall (*Literary and Mechanics' Institution*).
Colchester (*Literary Institution*).
———— (*Young Men's Christian Association*).
Compstall (*Athenæum*).
Coventry (*Free Library*).
———— (*Institute*).
———— (*School of Art*).
Crediton (*Working Men's Club*).
Crewe (*Mechanics' Institution*).
Dartmouth (*Mutual Improvement Society*).
Deal (*Deal and Walmer Institute*).
Denton (*Denton and Haughton Mechanics' Institution*).
Derby (*Mechanics' Institution*).
Devonport (*Mechanics' Institute*).
Dewsbury (*Mechanics' Institution*).
Diss (*Reading Room and Library*).
Doncaster (*Free Library*).
———— (*Great Northern Mechanics' Institute*).
Dorchester (*County Museum and Library*).
————(*Working Men's Institute*).
Dudley (*Mechanics' Institution*).
Dukinfield (*Village Library and Reading Room*).
Dumbarton (Philosophical and Literary Society).
Dumfries (Mechanics' Institution).

Dundee (*Young Men's Christian Association and Literary Institution*).
Durham (*Mechanics' Institute*).
Eagley, Bolton-le-Moors (*Library and Institute*).
Ealing (*Mechanics' Institute*).
Earlestown, Newton-le-Willows (*Mutual Improvement Society*).
Ebbw Vale (*Literary and Scientific Institute*).
Edinburgh (*Philosophical Institution*).
—— (*Royal Scottish Society of Arts*).
—— (*Subscription Library*).
—— (*Watt Institution and School of Art*).
—— (*Working Men's Club*).
Egham (*Literary Institute*).
Egremont (*Mechanics' Institute*).
—— (*Workmen's Institute*).
Exeter (*Devon and Exeter Albert Memorial Museum, School of Science and Art, and Free Library*).
—— (*Devon and Exeter Institution*).
Farnham (*Young Men's Association*).
Faversham (*Institute*).
Frome (*Literary and Scientific Institution*).
—— (*Mechanics' Institution*).
Gainsborough (*Literary, Scientific and Mechanics' Institute*).
Garforth, near Leeds (*Working Men's Club*).
Glasgow (*Athenæum*).
—— (*Central Working Men's Club and Institute*).
—— (*Institution of Engineers in Scotland*).
—— (*Mechanics' Institution, Bath Street*).
—— (*Philosophical Society*).
Glastonbury (*Literary Institute*).
Godmanchester (*Working Men's Reading Room*).
Gosport (*Gosport and Alverstoke Literary and Scientific Institution*).
Grantham (*Public Literary Institution*).
Gravesend (*Gravesend and Milton Library and Reading Rooms*).
Greenwich (*Working Men's Institute*).
Guernsey (*Mechanics' Institution and Literary Society*).
—— (*Working Men's Association*).
Guildford (*Mechanics' Institute*).
—— (*Working Men's Institution*).
Hadleigh (*Young Men's Institute*).
Halesworth (*Mechanics' Institute*)
Halifax (*Literary and Philosophical Society*).
—— (*Mechanics' Institute*).
—— (*Working Men's College*).
Halstead (*Literary and Mechanics' Institute*).
Haslingdon (*Institute*).
Hastings (*Literary and Scientific Institute*).
—— (*Mechanics' Institution*).
Hawarden (*Literary Institution*).
Hebden Bridge, near Todmorden (*Mechanics' Institution*).
Helston (*Reading Room and Library*).
Hemel Hempsted (*Mechanics' Institute*).
Hereford (*Natural History, Philosophical, Antiquarian, and Literary Society*).
Hertford (*Literary and Scientific Institution*).
Heywood (*Mechanics' Institute*).
Hitchin (*Mechanics' Institute*).
Holbeck (*Mechanics' Institution*).
Hollingwood (*Working Men's Club*).
Holt, Norfolk (*Literary Society*).
Holywell Green (*Mechanics' Institution*).
Horncastle (*Mechanics' Institution*).
Huddersfield (*Mechanics' Institution*).
Hull (*Church Institute*).
—— (*Literary, Scientific, and Mechanics' Institute*).
—— (*Lyceum Library*).
—— (*Royal Institution, Albion Street*).
—— (*Young People's Institute*).
Huntingdon (*Literary and Scientific Institution*).
Inverness (*Working Men's Club*).
Ipswich (*Working Men's College*).
Kendal (*Christian and Literary Institute*).
—— (*Mechanics' Institute*).
—— (*Working Men's Institute*).
Kidderminster (*Mechanics' Institute*).
Lancaster (*Mechanics' Institute and School of Science*).
Lee, Kent (*Working Men's Institution*).
Leeds (*Chapeltown Branch Library*).
—— (*Church Institute*).
—— (*Holbeck Branch Library*).
—— (*Hunslet Branch Library*).
—— (*Leeds Library*).
—— (*Mechanics' Institution and Literary Society*).
—— (*Philosophical and Literary Society*).
—— (*Working Men's Institute*).
—— (*Young Men's Christian Association*).
Leek, Staffordshire (*Literary and Mechanics' Institution*).
Leicester (*Law Society*).
—— (*Young Men's Christian Association*).
Leighton Buzzard (*Working Men's Mutual Improvement Society*).
Leith (*Mechanics' Subscription Library*).
Lewes (*Fitzroy Memorial Library*).
—— (*Mechanics' Institute*).
—— (*School of Science and Art*).
Lincoln (*Mechanics' Institute*).
Liverpool (*Institute*).
—— (*Mechanics' Institute*).
—— (*Medical Institution*).
—— (*Polytechnic Society*).
Llanelly (Chamber of Commerce and Reading Room).
Lockwood (Mechanics' Institution).

London (*Albert Working Men's Club, Knightsbridge*).
——— (*Bank of England Library and Literary Association*).
——— (*Beaumont Institute, Mile End*).
——— (*Bedford Working Men's Institute, Spitalfields*).
——— (*Birkbeck Institution, Southampton Buildings, Chancery Lane*).
——— (*Bow and Bromley Road Institute, Bow Road*).
——— (*Bow Common Working Men's Club, Devon's Road, Bow Common*).
———(*Christchurch Working Men's Club, New Street Lark Hall Lane, Clapham*).
——— (*Clerkenwell Club, Lower Rosoman Street*).
——— (*Holloway Working Men's Club and Institute, Holloway Road*).
——— (*Literary and Scientific Institution, Walworth*).
———(*London Association of Foremen Engineers and Draughtsmen*).
——— (*St. James and Soho Working Men's Club, Rupert Street, Soho*).
——— (*St. Mary Charterhouse Working Men's Club, Golden Lane*).
——— (*South London Working Men's College, Blackfriars Road*).
——— (*Southwark Working Men's Club, Broadwall, Stamford Street*).
——— (*Working Men's Club, Brixton Hill*).
——— (*Working Men's Club, St. Mark's, Victoria Docks*).
——— (*Working Men's Club and Institute, Battersea*).
——— (*Working Men's Club and Institute Union, Strand*).
——— (*Working Men's Club, Triangle, Hackney*).
———(*Working Men's College, Great Ormond Street*).
Lowestoft (*Library and Reading Room*).
Lye (*Institution*).
Lymington (*Literary Institute*).
Madeley, Shropshire (*Anstice Memorial, Workmen's Club and Institute*).
Maidstone (*St. Paul's Literary Institute*).
——— *Working Men's Club and Institute.*)
Maldon, Essex (*Literary and Mechanics' Institute*).
Manchester (*Ancoats Branch Free Library*).
——— (*Athenæum*).
——— (*Campfield Free Lending Library*).
——— (*Cheetham Branch Library*).
——— (*Chorlton and Ardwick Branch Free Library*).
——— (*Hulme Branch Free Library*).
——— (*Law Library*).
——— (*Mechanics' Institution*).
Manchester (*Natural History Museum, Peter Street*).
——— (*Owen's College*).
——— (*Portico Library, Mosley Street*).
——— (*Rochdale Road Branch Free Library*).
——— (*Royal Exchange Library*).
——— (*Scientific and Mechanical Society*)
Mausfield (*Co-operative Industrial Society*).
——— (*Mechanics', Artizans', and Apprentices' Library*).
——— (*Mechanics' Institute*).
Marlborough (*Reading and Mutual Improvement Society*).
——— (*Working Men's Hall*).
Melksham (*Mutual Improvement Society*).
Melton Mowbray (*Literary Institute*).
Mere, near Bath (*Literary Association*).
Merthyr-Tydfil (*South Wales Institute of Engineers*).
Middlesborough (*Iron and Steel Institute*).
——— (*Mechanics' Institution*).
Middlewich (*Literary and Scientific Institution*).
Modbury (*Mechanics' Institution*).
Mossley (*Mechanics' Institute*).
Needham Market (*Literary Association*).
Newark (*Mechanics' Institute*).
Newbury (*Literary and Scientific Institution*).
Newcastle-upon-Tyne (*Mechanics' Institution*).
——— (*Working Men's Club*).
New Mills, near Stockport (*Mechanics' Institute*).
Newport, Isle of Wight (*Young Men's Society and Reading Room*).
Northampton (*Mechanics' Institute*).
Nottingham (*Free Library*).
——— (*Mechanics' Institution*).
——— (*Subscription Library, Bromley House*).
Odiham (*Mechanics' Institution*).
Oldham (*Analytic Literary Institution*).
——— (*Mechanics' Institution, Werneth*).
Ormskirk (*Public Library*).
Oswestry (*Institute*).
Over, Cheshire (*Working Men's Institute*).
Oxford (*North Oxford Working Men's Club*).
Patricroft (*Mechanics' Institution*).
Pembroke Dock (*Mechanics' Institute*).
Pendleton (*Mechanics' Institution*).
Penryn (*Working Men's Club and Reading Room*).
Perth (*Mechanics' Library, High Street*).

Peterborough (*Mechanics' Institution*).
Plymouth (*Working Men's Institute*).
Poole (*Literary and Scientific Institution*).
——— (*Mechanics' Institute*).
Portsea Island (*Young Men's Christian Association*).
Preston (*Institution for the Diffusion of Knowledge*).
Reigate (*Mechanics' Institution*).
Retford (*Literary and Mutual Improvement Society*).
Richmond (*Working Men's College*).
Rotherham (*Rotherham and Masbro' Literary and Mechanics' Institute*).
Royston (*Institute*).
Ryde, Isle of Wight (*Literary and Scientific Institution*).
——— (*Philosophical and Scientific Society*).
Saffron Walden (*Literary and Scientific Institution*).
St. Just (*Institution*).
St. Leonard's (*Mechanics' Institution*).
Salford (*Working Men's Club*).
Salisbury (*Literary and Scientific Institution*).
Saltaire (*Literary Institute*).
Selby (*Mechanics' Institute*).
Sevenoaks (*Literary and Scientific Institution*).
Shaftesbury (*Literary Institution*).
Sheerness (*Literary Institute*).
Sheffield (*Branch Free Library*).
——— (*Brightside Branch Library*).
——— (*Literary and Philosophical Society, School of Arts*).
——— (*Mechanics' Institution*).
Shepton Mallet (*Reading and Mutual Improvement Society*).
Sidmouth (*Mechanics' Hall*).
Skipton, Yorkshire (*Mechanics' Institute*).
Slough (*Mechanics' Institute*).
Smethwick, Staffordshire (*Library, Reading Room, and Literary Institute*).
Southampton (*Polytechnic Institution*).
——— (*Workmen's Hall*).
Southport (*Athenæum*).
South Shields (*Working Men's Institute and Club*).
Southwell (*Literary Institution*).
Spalding (*Mechanics' Institute*).
——— (*Christian Young Men's Association*).
Staines (*Literary and Scientific Institution*).
——— (*Mechanics' Institute and Reading Room*).
Stalybridge, Cheshire (*Mechanics' Institution*).
Stamford (*Institution*).
Stourbridge (*Associated Institute*).
——— (*Church of England Association*).
——— (*Iron Works Reading Room and Library*).
——— (*Mechanics' Institution*).
Stourbridge (*Working Men's Institute*).
Stowmarket (*Literary Institution*).
Stratford (*Working Men's Hall*).
Sudbury, Suffolk (*Literary and Mechanics' Institute*).
Sunderland (*Working Men's Club*).
Swansea (*Royal Institution of South Wales*).
——— (*Working Men's Institute*).
Tavistock (*Mechanics' Institute*).
——— (*Public Library*).
Thornton, near Bradford (*Mechanics' Institute*).
Thornton Heath, Croydon (*Workmen's Club*).
Todmorden (*Mechanics' Institution*.)
Truro (*Cornwall County Library*).
——— (*Institution*).
——— (*Royal Institution of Cornwall*).
Tunbridge (*Literary and Scientific Institute*).
——— (*Mechanics' Institute*.)
Tunbridge Wells (*Mechanics' Institution*).
——— (*Society of Literature and Science*).
Turton, near Bolton (*Chapel Town Institute*).
Tynemouth (*Free Public Library*).
Ulverston (*Temperance Hall*).
Uttoxeter (*Mechanics' Literary Institute*).
Uxbridge (*Uxbridge and Hillingdon Reading and Newsroom Institute*).
Wakefield (*Mechanics' Institute*).
Wallingford (*Free Library and Literary Institute*).
Walsall (*Free Library*).
Walsham-le-Willows, Suffolk (*Institute*).
Ware (*Institute*).
Warminster (*Athenæum*).
Watford (*Literary Institute*).
Wells, Somerset (*Mechanics' Institution, Grove Lane*).
——— (*Young Men's Society*).
Whaleybridge (*Mechanics' Institute*).
Whitby (*Institute*).
——— (*Museum*).
——— (*Subscription Library*).
Whitehaven (*Mechanics' Institute*).
——— (*Working Men's Reading Room*).
Whitstable (*Institute*).
Wilton (*Literary Institute*).
Winchester (*Mechanics' Institution*).
——— (*Training College*).
Wirksworth (*Mechanics' Institution*).
Wisbeach (*Mechanics' Institute*).
Witham (*Literary Institution*).
Witney (*Athenæum*).
Wolverhampton (*Law Library*).
——— (*Library*).
Wolverton (Institute).
Woodbridge (Literary and Mechanics' Institute).
——— (Working Men's Hall).

Worcester (*Railway Literary Institute*).
——— (*Workman's Hall*).
Yarmouth, Great (*Parochial Library and Museum*).
Yeovil (*Mutual Improvement Society*).
York (*Church Institute*).
——— (*Institute of Popular Science &c.*)
——— (*North Eastern Railway Library and Reading Room.*)

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London (*House of Lords*).
——— (*House of Commons*).
London (*Hon. Soc. of Gray's Inn*).
——— („ „ *Inner Temple*).
——— („ „ *Lincoln's Inn*).
——— („ „ *Middle Temple*)
——— (*Aeronautical Society*).
——— (*Athenæum Club, Pall Mall*).
——— (*British Horological Institute*).
——— (*General Post Office*).
——— (*Institution of Civil Engineers*).
——— (*Odontological Society*).
——— (*Royal Society*).
——— (*United Service Museum*).
Manchester (*Literary and Philosophical Society, George Street*).
——— (*Mechanics' Institution David Street*).
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——— Industrial University Champaign, Illinois.
——— Mechanics' Institute, San Francisco.
——— Mercantile Library Association, Pittsburgh, Pennsylvania.
——— Odd Fellows' Library Association, San Francisco.
——— Smithsonian Institute, Washington.
——— Wabash College, Crawfordsville, Indiana.
——— Young Men's Christian Association, Scranton, Pennsylvania.

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June, 1874.